

DEPARTMENT OF COMMERCE**National Oceanic and Atmospheric Administration****50 CFR Part 217**

RIN 0648–BL73

[Docket No. 240827–0228]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Atlantic Shores South Project Offshore of New Jersey

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

ACTION: Final rule.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA), as amended, the National Marine Fisheries Service (hereafter, “NMFS”) promulgates regulations to govern the incidental taking of marine mammals by Atlantic Shores Offshore Wind Project 1, LLC, the project company of the original applicant, Atlantic Shores Offshore Wind, LLC, a joint venture between EDF–RE Offshore Development LLC (a wholly owned subsidiary of EDF Renewables, Inc.) and Shell New Energies US LLC, during the construction of the Atlantic Shores South Project (hereafter, “Atlantic Shores South” or the “Project”), an offshore wind energy project located in Federal and State waters offshore of New Jersey, specifically within the Bureau of Ocean Energy Management (hereafter, “BOEM”) Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (hereafter, “OCS”) Lease Areas OCS–A–0499 and OCS–A–0570 (hereafter, “Lease Areas”) and along export cable routes to sea-to-shore transition points. The Project will be divided into 2 projects in 2 areas: Project 1 and Project 2 (the combined hereafter referred to as the “Project Area”), over the course of 5 years (January 1, 2025, through December 31, 2029). Of note, the proposed rule for this action named only OCS–A–0499 and the parent company, Atlantic Shores Offshore Wind LLC, with 2 subsidiaries who control each component of the Project (*i.e.*, Project 1 is controlled by Atlantic Shores Offshore Wind Project 1, LLC, and Project 2 is controlled by Atlantic Shores Offshore Wind Project 2, LLC). However, after publication of the proposed rule, Atlantic Shores Offshore

Wind LLC notified NMFS that this rulemaking should be issued for Atlantic Shores Offshore Wind Project 1, LLC (“Project Company 1”). Furthermore, Project Company 1 now maintains ownership of both Project 1 and Project 2, rather than 2 separate subsidiaries for each of Project 1 and Project 2. As a result of this, the applicant requested that the Letter of Authorization (hereafter, “LOA”), if issued, be issued to Project Company 1, which would oversee the construction of both Project 1 and Project 2 (where the latter Project would be operated by “Atlantic Shores Offshore Wind Project 2, LLC” (“Project Company 2”). These regulations, which allow for the issuance of a LOA for the incidental take of marine mammals during construction-related activities within the Project Area during the effective dates of the regulations, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat as well as requirements pertaining to the monitoring and reporting of such taking.

DATES: This rule is effective from January 1, 2025, through December 31, 2029.

FOR FURTHER INFORMATION CONTACT: Kelsey Potlock, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:**Availability**

A copy of Project Company 1’s Incidental Take Authorization (hereafter, “ITA”) application, supporting documents, received public comments, and the proposed rulemaking, 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-other-energy-activities-renewable>. In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Purpose and Need for Regulatory Action

This final rule, as promulgated, provides a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) for NMFS to allow the take of marine mammals incidental to construction of the Project within the Project Area. NMFS received a request from Project Company 1 to incidentally take 16 species of marine mammals, comprising 17 stocks (*i.e.*, 9 species by Level A harassment and Level B harassment and 7 species by Level B

harassment only), incidental to Project Company 1’s 5 years of construction activities. No mortality or serious injury is anticipated or allowed in this final rulemaking. Please see the *Legal Authority for the Final Action* section below for definitions of harassment, serious injury, and incidental take.

Legal Authority for the Final Action

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, regulations are promulgated (when applicable), and public notice and an opportunity for public comment are provided.

Allowing for and authorizing 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). If such findings are made, NMFS must: (1) prescribe the permissible methods of taking; (2) analyze “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 (hereafter referred to as “mitigation”); and (3) enact requirements pertaining to the monitoring and reporting of such takings.

As noted above, no serious injury or mortality is anticipated or allowed in this final rule. Relevant definitions of MMPA statutory and regulatory terms are included below:

- *U.S. Citizens*—individual U.S. citizens or any corporation or similar entity if it is organized under the laws of the United States or any governmental unit defined in 16 U.S.C. 1362(13) (50 CFR 216.103);
- *Take*—to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal (see 16 U.S.C. 1362(13); 50 CFR 216.3);
- *Incidental harassment, incidental taking, and incidental, but not intentional, taking*—an accidental taking. This does not mean that the taking is unexpected, but rather it

includes those takings that are infrequent, unavoidable, or accidental (see 50 CFR 216.103);

- *Serious Injury*—any injury that will likely result in mortality (see 50 CFR 216.3);

- *Level A harassment*—any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild (see 16 U.S.C. 1362(18); 50 CFR 216.3); and

- *Level B harassment*—any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (see 16 U.S.C. 1362(18); 50 CFR 216.3).

Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I provide the legal basis for proposing and, if appropriate, issuing regulations and an associated LOA. This final rule establishes permissible methods of taking and mitigation, monitoring, and reporting requirements for Project Company 1's construction activities.

Summary of Major Provisions Within the Final Rule

The major provisions of this final rule are:

- The allowed take of marine mammals by Level A harassment and/or Level B harassment;

- No allowed take of marine mammals by mortality or serious injury;

- The establishment of a seasonal moratorium on pile driving of foundation piles during the months of the highest presence of North Atlantic right whales (*Eubalaena glacialis*) in the Lease Areas (January 1st through April 30th, annually, and in December unless it is necessary to complete the Project and if it is approved by NMFS to minimize the number of North Atlantic right whale takes);

- A requirement for NOAA Fisheries-approved Protected Species Observers (hereafter, "PSOs") and Passive Acoustic Monitoring (hereafter, "PAM") operators (where required) to conduct both visual and passive acoustic monitoring before, during, and after select activities;

- A requirement for training for all Project Company 1 personnel to ensure marine mammal protocols and procedures are understood;

- The establishment and implementation of clearance and shutdown zones for all in-water construction activities to prevent or reduce the risk of Level A harassment

and to minimize the risk of Level B harassment;

- A requirement to use sound attenuation devices during all foundation pile driving installation activities to reduce noise levels to those modeled assuming 10 decibels (dB);

- A delay to the start of foundation installation if a North Atlantic right whale is observed at any distance by PSOs or acoustically detected within the PAM Clearance/Shutdown Zone (10 kilometer (km) (6.21 miles (mi)));

- A delay to the start of foundation installation if other marine mammals are observed entering or within their respective clearance zones;

- A requirement to shut down pile driving (if feasible, otherwise "powering down" (*i.e.*, reducing the impact hammer's energy) is required) if a North Atlantic right whale is observed at any distance or if any other marine mammals are observed entering their respective shutdown zones;

- A requirement to conduct sound field verification (SFV) during foundation pile driving to measure *in situ* noise levels for comparison against the modeled results;

- A requirement to implement soft-starts during all impact pile driving using the least amount of hammer energy necessary for installation;

- A requirement to implement ramp-up during the use of non-binary high-resolution geophysical (HRG) marine site characterization survey equipment;

- A requirement to monitor the relevant Right Whale Sightings Advisory System, the United States' Coast Guard's Channel 16, and NMFS' website at: <https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>, as well as reporting any sightings to the sighting network;

- A requirement to implement various vessel strike avoidance measures;

- A requirement to implement measures during fisheries monitoring surveys, such as removing gear from the water if marine mammals are considered at-risk or are interacting with gear; and

- A requirement to submit frequent regularly scheduled and situational reports including, but not limited to, information regarding activities occurring, marine mammal observations and acoustic detections, and SFV monitoring results.

NMFS must withdraw or suspend any LOA issued under these regulations, after notice and opportunity for public comment, if it finds the methods of taking or the mitigation, monitoring, or

reporting measures are not being substantially complied with (16 U.S.C. 1371(a)(5)(B); 50 CFR 216.106(e)). Additionally, failure to comply with the requirements of the LOA may result in civil monetary penalties and knowing violations may result in criminal penalties (16 U.S.C. 1375; 50 CFR 216.106(g)).

Fixing America's Surface Transportation Act (FAST-41)

This Project is covered under Title 41 of the Fixing America's Surface Transportation Act or "FAST-41". FAST-41 includes a suite of provisions designed to expedite the environmental review for covered infrastructure Projects, including enhanced interagency coordination as well as milestone tracking on the public-facing Permitting Dashboard. FAST-41 also places a 2-year limitations period on any judicial claim that challenges the validity of a Federal agency decision to issue or deny an authorization for a FAST-41 covered project (42 U.S.C. 4370m-6(a)(1)(A)).

Atlantic Shores South is listed on the Permitting Dashboard, where milestones and schedules related to the environmental review and permitting for the Project can be found at: <https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/atlantic-shores-south>.

Summary of Request

On February 8, 2022, NMFS received a request from Project Company 1 (previously, "Atlantic Shores") for the promulgation of regulations and the issuance of an associated LOA to take marine mammals incidental to construction activities associated with the Project located offshore of New Jersey in Lease Area OCS-A-0499 (then, a single lease) and associated export cable corridors. Project Company 1's request is for the incidental, but not intentional, take of a small number of 16 marine mammal species comprising 17 stocks (*i.e.*, 9 species by Level A harassment and Level B harassment and 7 species by Level B harassment only). Neither Project Company 1 nor NMFS expected serious injury and/or mortality to result from the specified activities. Because of this, Project Company 1 did not request, and NMFS has not allowed mortality or serious injury of any marine mammal species or stock.

In response to our questions and comments and following extensive information exchanges with NMFS, Project Company 1 submitted a final, revised application on August 12, 2022 that NMFS deemed adequate and complete on August 25, 2022. The final

version of the application is available on NMFS' website at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>.

On September 29, 2022, NMFS published a notice of receipt (NOR) of the adequate and complete application in the **Federal Register** (87 FR 59061), requesting public comments and information related to Project Company 1's request during a 30-day public comment period. Due to a request from a public group called Save Long Beach Island, Inc. (SaveLBI), NMFS extended the public comment period for an additional 15 days (87 FR 65193, October 28, 2022) for a total of a 45-day public comment period. During the 45-day NOR public comment period, NMFS received 5 comments and letters from the public, including a citizen, an environmental non-governmental organization (hereafter, "eNGO"), and a local citizen group. NMFS has reviewed all submitted material and has taken these into consideration during the drafting of this final rulemaking.

On September 22, 2023, NMFS published a proposed rule in the **Federal Register** for the Project (88 FR 65430). In the proposed rule, NMFS synthesized all of the information provided by Project Company 1, all best available scientific information and literature relevant to the proposed Project, outlined, in detail, proposed mitigation designed to effect the least practicable adverse impacts on marine mammal species and stocks as well as proposed monitoring and reporting measures, and made preliminary negligible impact and small numbers determinations. The public comment period on the proposed rule was open for 30 days at: <https://www.regulations.gov>, starting on September 22, 2023 and closing after October 23, 2023. The public comments can be viewed at: <https://www.regulations.gov/docket/NOAA-NMFS-2023-0068>. A summary of public comments received during this 30-day period and NMFS responses are described in the Comments and Responses section.

In June 2022, Duke University's Marine Spatial Ecology Laboratory released updated habitat-based marine mammal density models (Roberts *et al.*, 2016a; Roberts *et al.*, 2023). After consideration by NMFS, and because Project Company 1 applied previous marine mammal densities to their analysis in their initially submitted application, Project Company 1 reanalyzed its Project using the new Duke University data and submitted a final Updated Density and Take

Estimation Memorandum on March 28, 2023 that included marine mammal densities and take estimates based on these new models. This memorandum can be found on NMFS' website at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. This information was incorporated into the proposed rule (88 FR 65430, September 22, 2023).

During the development of the proposed rule during the months of January and February 2023, Project Company 1 informed NMFS that the proposed activity had been narrowed from what was presented in the adequate and complete MMPA application. Specifically, Project Company 1 committed to installing only monopile wind turbine generator (WTG) foundations for Project 1 (and any found in the associated Overlap Area), as opposed to either monopile or jacket foundations. All WTGs built for Project 2 (and any remaining Overlap Area) may still consist of either monopiles or jacket foundations as presented in the adequate and complete MMPA application. Additionally, all offshore substation (OSS) foundations that could be developed across both Projects 1 and 2 continue to maintain build-outs using only jacket foundations. Project Company 1 provided a memo and supplemental materials outlining these changes to NMFS on March 31, 2023. These supplemental materials can be found on NMFS' website at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>.

On August 1, 2022, NMFS announced proposed changes to the existing North Atlantic right whale vessel speed regulations (87 FR 46921, August 1, 2022) to further reduce the likelihood of mortalities and serious injuries to endangered right whales from vessel collisions, which are a leading cause of the species' decline and a primary factor in an ongoing Unusual Mortality Event (hereafter, "UME"). Should a final vessel speed rule or any other MMPA ITA be issued and become effective during the effective period of these regulations, Atlantic Shores will be required to comply with any and all applicable requirements contained within the final rule. Specifically, where measures in any final vessel speed rule are more protective or restrictive than those in this or any other MMPA ITA, Atlantic Shores will be required to comply with the requirements of the vessel speed rule. Alternatively, where measures in this or any other MMPA ITA are more restrictive or protective than those in any final vessel speed

rule, the measures in the MMPA ITA will remain in place. The responsibility to comply with the applicable requirements of any vessel speed rule will become effective immediately upon the effective date of any final vessel speed rule, and when notice is published on the effective date, NMFS will also notify Project Company 1 if the measures in the speed rule were to supersede any of the measures in the MMPA ITA such that they were no longer required.

On June 26, 2024, Atlantic Shores Offshore Wind LLC provided a written request to NMFS to change the LOA Holder from Atlantic Shores Offshore Wind LLC to Project Company 1, who would oversee and be responsible for the construction of both Project 1 and Project 2. Furthermore, on June 26, 2024, Atlantic Shores Offshore Wind LLC notified NMFS that it had requested that BOEM segregate a portion of Lease Area OCS-A-0499, which would then be assigned to another subsidiary of Atlantic Shores, Project Company 2, as Lease Area OCS-A-0570. As described above, Project Company 1 requested to NMFS that the incidental take regulation (ITR) governing take of marine mammals incidental to activities associated with both phases of the Project and the associated LOA (if issued by NMFS) be issued to Project Company 1, which would oversee Project 1 (constructed and operated by Project Company 1) and Project 2 (constructed and operated by Project Company 2) of the Atlantic Shores South Project. The lease segregation is expected to be completed by BOEM on September 30, 2024, and will not alter the geographic location or size of the area in which either Project 1 or Project 2 would be built, nor will it cause any changes to the construction schedule, planned activities, or take. In short, no changes to the overall Project were requested or are expected, with the exception of the name change. As a result, where appropriate, Project Company 1, the owner of the Project, has henceforth been incorporated as the "applicant" or "LOA Holder" throughout this final rule.

NMFS has previously issued 5 Incidental Harassment Authorizations (hereafter, "IHAs"), including 1 renewal IHA to Project Company 1 authorizing take incidental to high-resolution site characterization surveys offshore New Jersey in the now segregated OCS-A-0499 (to include OCS-A-0570) (see 85 FR 21198, April 16, 2020; 86 FR 21289, April 22, 2021 (renewal); 87 FR 24103, April 22, 2022; 88 FR 38821, June 14, 2023; and 89 FR 20434, March 22, 2024).

To date, Project Company 1 has complied with all the requirements (e.g., mitigation, monitoring, and reporting) of the previous IHAs and information regarding Project Company 1’s take estimates, and monitoring results may be found in the Estimated Take section. Final monitoring reports can be found on NMFS’ website, along with previously issued IHAs at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>.

Description of the Specified Activities

Overview

Project Company 1 plans to construct and operate two offshore wind projects, Project 1 and Project 2, (collectively, Atlantic Shores South, or the Project) in the Lease Areas. These Lease Areas are located within the New Jersey Wind Energy Area (hereafter, “NJ WEA”). Collectively, Atlantic Shores South will consist of up to 200 WTGs, 10 OSSs, and 1 Met Tower divided into two projects: Project 1 and Project 2. These projects would assist the State of New Jersey to meet its renewable energy goals under the New Jersey Offshore Wind Economic Development Act (hereafter, “OWEDA”). Project Company 1 has been given an allowance by the New Jersey Board of Public Utilities through an Offshore Renewable Energy Certificate (hereafter, “OREC”) to construct a facility capable of delivering 1,510 megawatts (MW) of renewable energy to the State of New Jersey through Project 1. Project 1 would be capable of powering approximately 700,000 homes (see <https://atlanticshoreswind.com/atlantic-shores-offshore-wind-receives-record-of-decision-for-atlantic-shores-project-1-and-2/>). Project Company 1 also intends to compete for a second OREC award through a competitive solicitation process to develop Project 2, which will be owned by another affiliate company of Project Company 1, Project Company 2, although Project Company 1 will oversee Project 2’s development. Collectively, the entire Project is capable of powering over 1 million homes (see [https://atlanticshoreswind.com/atlantic-shores-offshore-wind-receives-record-of-](https://atlanticshoreswind.com/atlantic-shores-offshore-wind-receives-record-of-decision-for-atlantic-shores-project-1-and-2/)

[decision-for-atlantic-shores-project-1-and-2/](https://atlanticshoreswind.com/atlantic-shores-offshore-wind-receives-record-of-decision-for-atlantic-shores-project-1-and-2/)).

The Project will consist of several different types of permanent offshore infrastructure, including: (1) up to 200 15–MW WTGs and up to 10 OSSs; (2) a single Met Tower; and (3) OSS array cables and interconnector cables. All permanent foundations (WTGs, OSSs, and the single Met Tower) will be installed using impact pile driving only. For the permanent foundations, Project Company 1 originally considered three construction scenarios for the completion of Projects 1 and 2. All three Schedules assume a start year of 2026 for WTG, Met Tower, and OSS foundation installation. Schedules 1 and 3 assume monopile foundations for all WTGs and the Met Tower across both Projects 1 and 2. Schedule 2 originally assumed a full jacket foundation buildout for both Projects 1 and 2. However, Project Company 1 has modified Schedule 2 to now assume that all WTGs and the Met Tower in Project 1 would be built using monopiles. The WTGs for Project 2 would still consist of either jacket or monopile foundations. In all Schedules, the OSS foundations would always be built out using jacket foundations. However, these may vary in size between the two Projects (i.e., small, medium, or large OSSs). Under Schedules 1 and 2, foundations would be constructed in 2 years. Under Schedule 3, all permanent foundations would be installed within a single year.

Project Company 1 would also conduct the following specified activities: (1) temporarily installation and removal, by vibratory pile driving, of up to eight nearshore cofferdams to connect the offshore export cables to onshore facilities; (2) deployment of up to four temporary meteorological and oceanographic (hereafter, “metocean”) buoys (three in Project 1 and one in Project 2); (3) conducting of several types of fishery and ecological monitoring surveys; (4) placement of scour protection, trenching, laying, and burial activities associated with the installation of the export cable route from OSSs to shore-based switching and substations and inter-array cables between turbines; (5) conducting of HRG vessel-based site characterization

and assessment surveys using active acoustic sources with frequencies of less than 180 kilohertz (hereafter, “kHz”); (6) transiting within the Project Area and between ports and the Lease Areas to transport crew, supplies, and materials to support pile installation via vessels; and (7) WTG operation. All offshore cables would be connected to onshore export cables at the sea-to-shore transition points located in Atlantic City, New Jersey (hereafter, “Atlantic City landfall site”) and in Sea Girt, New Jersey (hereafter, “Monmouth landfall site”). From the sea-to-shore transition point, onshore underground export cables are then connected in series to switching stations/substations, overhead transmission lines, and ultimately to the grid connection. No detonations of unexploded ordnance or munitions and explosives of concern (hereafter, “UXOs/MECs”) were planned to occur, nor are they included in this final rulemaking. Therefore, these are not discussed further and no take has been allowed for these activities.

Marine mammals exposed to elevated noise levels during vibratory and impact pile driving and site characterization surveys may be taken by Level A harassment and/or Level B harassment, depending on the specified activity and species.

A detailed description of the specified activities is provided in the proposed rule as published in the **Federal Register** (88 FR 65430, September 22, 2023). Since the proposed rule was published, Project Company 1 has not modified the specified activities. Please refer to the proposed rule for more information on the description of the specified activities.

Dates and Duration

Project Company 1 anticipates its specified activities to occur throughout all 5 years of the effective period of the regulations, beginning on January 1, 2025 and continuing through December 31, 2029. Project Company 1’s anticipated construction schedule can be found in table 1. Project Company 1 has noted that these are the best and conservative estimates for activity durations but that the schedule may shift due to weather, mechanical, or other related delays.

TABLE 1—CONSTRUCTION SCHEDULE

Activity	Duration ^a (months)	Expected schedule ^b	Project 1 start date	Project 2 start date
Onshore Interconnection Cable Installation	9–12	2024–2025	Q1—2024	Q1—2024
Onshore Substation and/or Onshore Converter Station Construction	18–24	2024–2026	Q1—2025	Q1—2025
HRG Survey Activities	3–6	2025–2029	Q2—2025	Q3—2025
Export Cable Installation	6–9	2025	Q2—2025	Q3—2025

TABLE 1—CONSTRUCTION SCHEDULE—Continued

Activity	Duration ^a (months)	Expected schedule ^b	Project 1 start date	Project 2 start date
Temporary Cofferdam Installation and Removal ^c	18–24	2025–2026	Q2—2025	Q3—2025
OSS installation and Commissioning	5–7	2025–2026	Q2—2026	Q2—2026
WTG Foundation and Met Tower Installation ^d	^e 10	2026–2027	Q1—2026	Q1—2026
Inter-Array Cable Installation	14	2026–2027	Q2—2026	Q3—2026
WTG Installation and Commissioning ^f	17	2026–2027	Q2—2026	Q1—2027
Met Buoy Deployments	36	2025–2027	Q1—2025	Q1—2025
Scour Protection Pre-Installation	17	2025–2027	Q2—2025	Q3—2025
Scour Protection Post-Installation	17	2025–2027	Q2—2025	Q3—2025
Site Preparation	60	2025–2029	Q1—2025	Q4—2029
Fishery Monitoring Surveys	60	2025–2029	Q1—2025	Q4—2029

Note: Q1 = January through March; Q2 = April through June; Q3 = July through September; Q4 = October through December.

^a These durations are a total across all years the activity may occur.

^b The expected timeframe, based on a modified Schedule 2, is indicative of the most probable duration for each activity; the timeframe could shift and/or extend depending on supply chains, weather, mechanical, or other related delays.

^c Project Company 1 intends to install the temporary cofferdams for a limited duration annually between Labor Day and Memorial Day (*i.e.*, between early September and late May). However, given limited species presence, the limited amount of work planned for the entire cable landfall activity, and the expected impact is not anticipated to rise above a small subset of take by Level B harassment (*i.e.*, no take by Level A harassment is expected), this rulemaking does not specifically require time-of-year restrictions on this activity.

^d As described in the proposed rule (88 FR 65430, September 22, 2023), the expected timeframe is dependent on the completion of the preceding Project 1 activities (*i.e.*, Project 1 inter-array cable installation and WTG installation) and the Project 2 foundation installation schedule.

^e A seasonal pile driving moratorium is in place from January 1st through April 30th, annually, unless pile driving must occur in December to complete the Project and NMFS allows for December pile driving to also occur.

^f Project Company 1 anticipates that WTGs for each Project would be commissioned starting in 2026 and 2027 but turbines would not become operational until 2028 and 2029.

Specific Geographic Region

A detailed description of the Specific Geographic Region is provided in the proposed rule as published in the **Federal Register** (88 FR 65430, September 22, 2023). Since the proposed rule was published, no changes have been made to the

Specified Geographic Region. Generally, Project Company 1’s planned activities (*i.e.*, impact pile driving of WTG, OSS, and Met Tower foundations; vibratory pile driving of temporary cofferdams (installation and removal); placement of scour protection; trenching, laying, and burial activities associated with the installation of the export cable and

inter-array cables; HRG site characterization surveys; and WTG operation) are concentrated in the Project Area (figure 1). A couple of Project Company 1’s specified activities (*i.e.*, fishery and ecological monitoring surveys and transport vessels) will occur in the Mid-Atlantic Bight.

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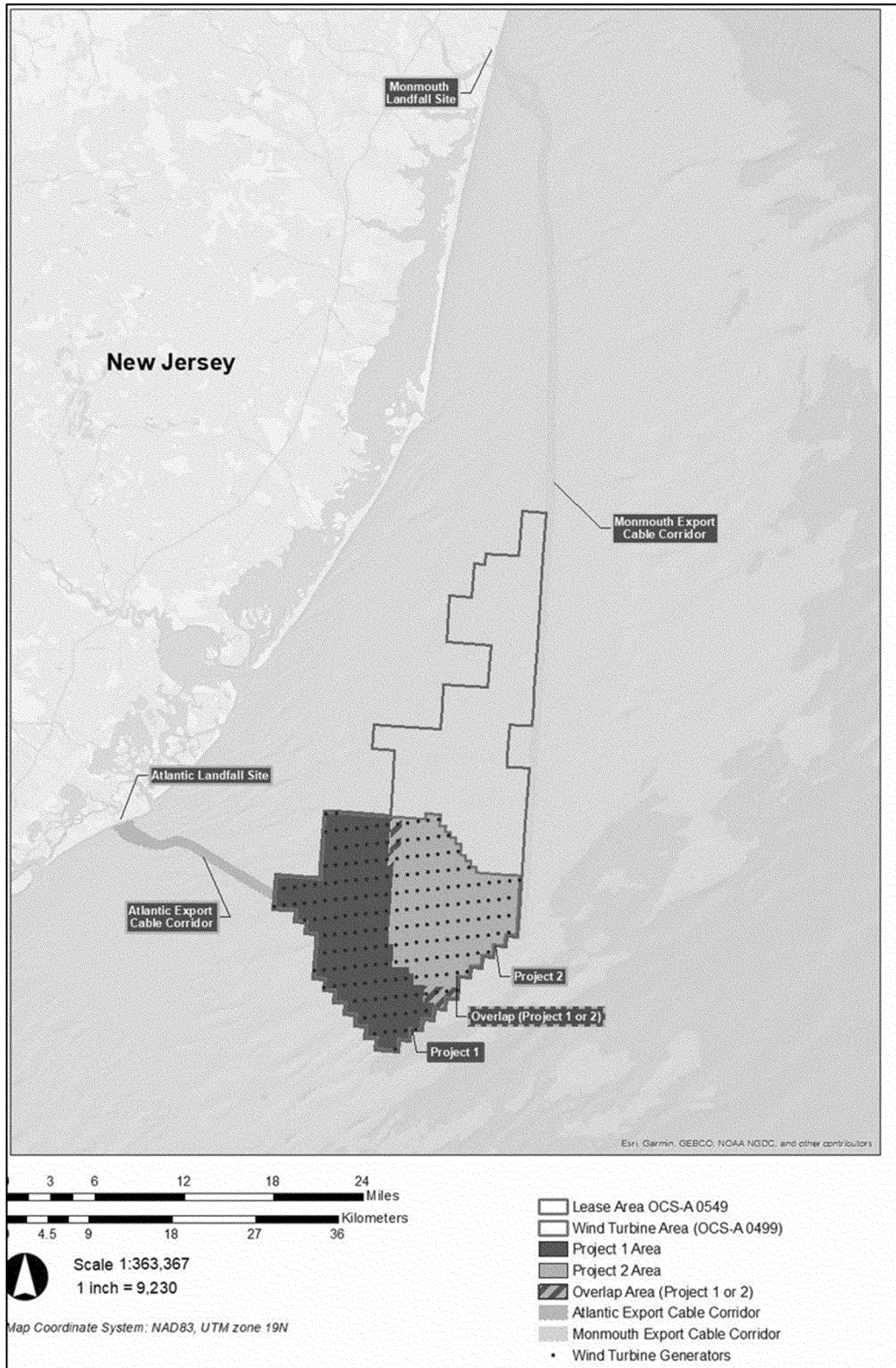


Figure 1 – Project Location

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Comments and Responses

A proposed rule was published in the **Federal Register** on September 22, 2023

(88 FR 65430). The proposed rule described, in detail, Project Company 1’s specified activities, the specified geographic region of the specified

activities, the marine mammal species that may be affected by those activities, and the anticipated effects on marine mammals. In the proposed rule, we requested that interested persons submit relevant information, suggestions, and comments on Project Company 1's request and the promulgation of regulations and issuance of an associated LOA described therein, our estimated take analyses, the preliminary determinations, and the proposed regulations. The proposed rule was available for a 30-day public comment period.

In total, NMFS received 57 comment submissions, comprising 55 individual comments from private citizens, 1 comment letter from the Marine Mammal Commission (hereafter, "the Commission"), and 1 comment letter with supplemental attachments from the public group, SaveLBI. Some of the comments received were considered out-of-scope, including, but not limited to: comments related to constructing wind farms on land; comments on language found in the draft Environmental Impact Statement (EIS); comments related to offshore wind in Europe; comments specifically about activities found in HRG IHAs; visibility of WTGs from the coast; concerns for other species outside of NMFS' jurisdiction (*i.e.*, birds); the pros and cons of renewable energy and nuclear power; costs and finances regarding the construction of offshore wind farms; fishing activities from commercial industries; lifespan of WTGs located offshore; and tourism. These comments are not described herein or discussed further. Moreover, where comments recommended that the final rule include mitigation, monitoring, or reporting measures that were already included in the proposed rule and such measures are carried forward in this final rule, they are not included here, as those comments did not raise significant points for NMFS to consider. Furthermore, if a comment received was unclear, we do not include it here as we could not determine whether it raised a significant point for NMFS to consider.

The two letters and supplemental attachments from the Commission and SaveLBI, as well as the individual comments, received during the public comment period contained significant points that NMFS considered in its estimated take analysis, including: required mitigation, monitoring, and reporting measures; final determinations; and final regulations. These are described and responded to below. All substantive comments and letters are available on NMFS' website at: <https://www.fisheries.noaa.gov/>

permit/incidental-take-authorizations-under-marine-mammal-protection-act. Please review the corresponding public comment link for full details regarding the comments and letters.

Modeling and Take Estimates

Comment 1: A commenter recommended that NMFS revise its take estimates from impact pile driving using a 5 dB broadband noise source attenuation, rather than the 10 dB of sound attenuation, with no attenuation at low frequencies.

Response: In the proposed rule, NMFS described the best available science, which supports the assumption that at least 10 dB attenuation can be reliably achieved using the required noise attenuation systems, including a double bubble curtain. This included data from Bellmann *et al.* (2020) where double bubble curtains achieved between 8 to 18 dB of broadband noise attenuation depending on water depth and supplied air volume. Bubble curtain effectiveness depends significantly on the supplied air volume and the water depth, with performance increasing with air flow and decreasing with depth. Notably, the proposed rule requires an air flow rate of at least 0.5 m³/(minute*m) and the Project Area has depths ranging from 19 to 37 meters (m) (62.34 to 121.39 feet (ft)). In the set of measurements from Bellmann *et al.* (2020), broadband noise attenuation was only less than 10 dB for supplied air flow rates between 0.3 and 0.4 m³/(minute*m) and in depths of approximately 40 m (131.23 ft). Because the double bubble curtain used in this Project will be in shallower water and have more supplied air volume, it is reasonable to expect performance greater than 8 dB and closer to the measurements of curtains with higher airflow and in shallower water (12–18 dB). Finally, results from Vineyard Wind 1's SFV (Küsel *et al.*, 2024) indicate that the median near pile (750 m (2,460.63 ft)) sound pressure level while using double bubble curtains, along with a near pile resonator, was approximately 171 dB. The modeling for Vineyard Wind 1, which assumed 6 dB attenuation, implied levels near 180 dB at 750 m (JASCO Applied Sciences (USA) Inc. (JASCO and LGL., 2019)). This indicates that the combination of source modeling and an assumption of 10 dB would have been conservative in that case. Finally, Project Company 1 is required to conduct SFV during installation of every pile and provide bubble curtain performance reports to NMFS which will assist in determining if the double bubble curtain is working properly and is optimized and noise

levels are as expected. Thus, NMFS finds that the mitigation requirements in the proposed rule, which include the use of a double bubble curtain and adherence to best practice standards for operation of noise mitigation systems, are capable of providing an expected 10 dB of attenuation, as evidenced by the extensive data from Bellmann *et al.* (2020) and initial SFVs in US waters.

With regard to the fact that NMFS' assumed 10 dB attenuation rate is broadband in nature and assumes this level of noise reduction at all frequencies, NMFS agrees that attenuation levels vary by frequency band and that bubble curtains attenuate higher frequency sounds more effectively; however, NMFS disagrees that lower frequency bands, which are important to consider when evaluating impacts, are not attenuated at all. The data from Bellmann (2021), shows that for both single and double bubble curtains, more than 10 dB of attenuation was achieved for bands as low as 32 Hz. And while it is true that performance diminishes significantly at lower frequencies (< 32 Hz), those bands also contain significantly less pile driving sound and are +16 dB outside the most susceptible frequency range for low-frequency cetaceans.

Comment 2: A commenter stated that NMFS did not provide an explanation of the revised take numbers from JASCO's August 10, 2022 Exposure Modeling Report in the proposed rule. They further stated that NMFS did not disclose information on how the source levels, exposure ranges, and proposed takes were calculated.

Response: The proposed rule clearly describes that the take estimates were updated due to the release of the new Duke Habitat-Based Density Models (Roberts *et al.*, 2023) which are the best available science. Modeling methodology, including source, propagation, and exposure modeling methodology were summarized in the proposed rule and were thoroughly described in the JASCO Exposure Modeling Report and ITA application materials. Moreover, the proposed rule reflected the most recent information provided by the applicant, which is available on our website at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>.

Comment 3: A commenter stated that NMFS underestimated Level A harassment and Level B harassment take estimates because the proposed rule applied density models to the take calculations that, according to the commenter, do not account for North

Atlantic right whale migration and NMFS should not use the 160 dB_{rms} threshold to estimate behavioral harassment from pile driving. The commenter recommended that NMFS revise the take estimates based on the North Atlantic right whale density estimates contained within the application (Roberts *et al.*, 2016a, 2016b, 2017, 2018, 2021a, 2021b), not the updated Roberts *et al.* (2023) densities, and the Wood *et al.* (2012) step-function in lieu of the 160 dB_{rms} threshold. Additionally, the commenter suggested a new approach to calculate take of marine mammals, wherein NMFS should calculate the ranges to elevated noise levels perpendicular to the whale's path and assume that the number of whales heading toward that is proportional to that range divided by 60 mi (96.6 km). They state that this approach will better allow MMPA ITAs to assess the Project's potential impact. The commenter provided their independent take calculations using these alternative methods.

Response: NMFS disagrees with the commenter's recommendations. First, the Wood *et al.* (2012) probabilistic step-function recommended for use by the commenter was derived by a select group of experts to assess the impacts of seismic air gun surveys involving moving sources. The commenter did not provide information that demonstrates the 160 dB_{rms} threshold is less appropriate other than that the alternative method they proposed, which only results in slightly more take than both the proposed and final rules, which was also inclusive of a 3.8 mean group size of North Atlantic right whales from the Ocean Biodiversity Information System (OBIS) repository (OBIS, 2022) (*i.e.*, the commenters suggested 27 takes against the proposed rule's 21 takes against the final rule's 25 takes of North Atlantic right whales over a 5-year period).

While NMFS acknowledges the potential for behavioral disturbance at exposures to received levels below 160 dB_{rms}, it should also be acknowledged that not every animal exposed to received levels above 160 dB_{rms} will be behaviorally disturbed. The 160-dB threshold functions as a mid-point and serves as a practical generalized tool for informing the predicted likelihood, and quantification, of Level B harassment. Additionally, there are a variety of studies indicating that contextual variables (*e.g.*, range to source, received levels (RL) above background noise, novelty of the signal, and differences in behavioral state) play a very important role in responses to anthropogenic noise (Ellison *et al.*, 2012; Gong *et al.*, 2014),

and the severity of effects are not necessarily linear when compared to a received level. DeRuiter *et al.* (2012) also indicate that variability of responses to acoustic stimuli depends not only on the species receiving the sound and the sound source, but also on the social, behavioral, or environmental contexts of exposure. Use of the 160-dB threshold allows for a simplistic quantitative estimate of take while we can qualitatively address the variation in responses across different received levels in our discussion and analysis.

Overall, we reiterate the lack of scientific consensus regarding what criteria might be more appropriate. Defining sound levels that disrupt behavioral patterns is difficult because responses depend on the context in which the animal receives the sound, including an animal's behavioral mode when it hears sounds (*e.g.*, feeding, resting, or migrating), prior experience, and biological factors (*e.g.*, age and sex). Other contextual factors, such as signal characteristics, distance from the source, and signal to noise ratio, may also help determine response to a given received level of sound. Therefore, levels at which responses occur are not necessarily consistent and can be difficult to predict (Southall *et al.*, 2007; Ellison *et al.*, 2012; Southall *et al.*, 2021). For example, Gomez *et al.* (2016) reported that received level was not an appropriate indicator of behavioral response. Further, the seminal reviews presented by Southall *et al.* (2007), Gomez *et al.* (2016), and Southall *et al.* (2021) did not suggest any specific new criteria due to lack of convergence in the data.

Given there is currently no concurrence on these complex issues, NMFS followed its practice at the time of submission and review of this application in assessing the likelihood of disruption of behavioral patterns by using the 160 dB threshold. NMFS is currently evaluating available information towards development of updated guidance for assessing the effects of anthropogenic sound on marine mammal behavior. However, undertaking a process to derive defensible exposure-response relationships, as suggested by Tyack and Thomas (2019), is complex. The recent systematic review by Gomez *et al.* (2016) was unable to derive criteria expressing these types of exposure-response relationships based on currently available data.

NMFS is committed to continuing its work in developing updated guidance with regard to acoustic thresholds but pending additional consideration and process, is reliant upon an established

threshold that is reasonably reflective of best available science.

With respect to the commenters' claim that different densities should be used, the most recent Duke University habitat-based density models are considered the best available science. The models statistically correlate sightings with sightings from shipboard and aerial surveys with oceanographic conditions. In 2023, Duke University updated the North Atlantic right whale model to also include independently collected PAM data, expanding the data set used in the model since the previous model that was recommended for use by the commenter (see https://seamap.env.duke.edu/models/Duke/EC/EC_North_Atlantic_right_whale_history.html). Marine mammal behavior, such as foraging and migration, are not part of the metadata used in the Duke University density models; however, the survey data was collected along the entire coast which includes migratory habitat (including the mid-Atlantic where the Project would be constructed). Therefore, the commenters claim that North Atlantic right whale migration was not accounted for in the models is incorrect. NMFS applied the most recent Duke University models to the analysis contained within this rule as it represents the best available science (versions 12, 12.1, and 12.2 for North Atlantic right whales (https://seamap.env.duke.edu/models/Duke/EC/EC_North_Atlantic_right_whale_history.html)).

Project Company 1 conducted sophisticated modeling using simulated animals exposed to foundation pile driving noise levels above NMFS' thresholds to estimate exposures. The details of how this modeling is conducted was summarized in the proposed rule and is fully described in appendix B of Project Company 1's application at: https://media.fisheries.noaa.gov/2022-09/AtlanticShoresOWF_2022_Appendix%20B_OPR1.pdf. For North Atlantic right whales, the exposure estimates were adjusted upwards to account for group size. For example, the estimated modeled Level B harassment exposures from full build out assuming Construction Schedule 2 for North Atlantic right whales was 8.13 (see table 16 in appendix B of Project Company 1's ITA application); however, the applicant requested 12 takes by Level B harassment (see table 17). Therefore, NMFS' final rule considered 12 takes by Level B harassment. The simple take estimate approach recommended by the commenter which considers whales heading perpendicular to a certain distance and assuming that the number of whales heading toward

that is proportional to that range divided by 60 mi (96.6 km) is illogical. First, the commenter claims that the Duke University density data suggests that over the January through April time period, most North Atlantic right whale migration is occurring within 60 mi (96.6 km) of shore. However, this is irrelevant as no pile driving would be occurring January through April; therefore, using 60 mi (96.6 km) in any take calculation is not supported. Moreover, the commenter does not identify the method by which a number of whales perpendicular a distance should be derived. The commenter did not provide reasoning for why this approach would better allow MMPA ITAs to assess the Project's potential impact. For these reasons, NMFS has determined the number of takes that would be authorized for North Atlantic right whales is based on the best available science.

Comment 4: Regarding HRG surveys, commenters stated that take estimates were underestimated because the use of a SIG ELC 820 unit as a proxy for the Dura-Spark unit is unjustified and not consistent with other higher values found in the technical literature (*i.e.*, Crocker and Fratantonio (2016)). The comment stated that NMFS should instead be utilizing a source level of 211 dB in their analysis, rather than the 203 dB used in the proposed rule and ITA application materials, and that NMFS should apply a more conservative spreading loss coefficient when calculating distances to the Level B harassment threshold.

The commenter asserts that NMFS has underestimated exposure based on the use of the SIG ELC 820 unit, and noise source levels from vessels operating in the same area are comparable or higher than 211 dB. In addition, the commenter cited other recent HRG IHAs in the New York Bight and Mid-Atlantic Bight that have been previously authorized to use the Dura-Spark (400 tip), ranging at 5,500 to 2,000 joules (J), which result in a higher dB level than what is presented in the proposed rule for the Atlantic Shores South Project. The commenter also stated that the 203 dB value is inconsistent with the Endangered Species Act (ESA) programmatic consultation report that NMFS uses for ESA compliance and that NMFS should not issue any more ITAs for offshore wind work and should, consequently, cancel the Project.

Response: There is little data available regarding appropriate choice of spreading loss (or transmission loss coefficient) for sparker acoustic sources. The commonly used convention, which is applied here by NMFS, is to use

spherical spreading for HRG sources (Ruppel *et al.*, 2022). The field measurements by Rand (2023) imply spreading coefficients greater than 20, which shows that spherical spreading in that case is a good approximation. With regard to source level, the ITA application specifies that the Dura-Spark 240 is typically operated between 500–600 J and chose a source level based on the SIG ELC 820 of 203 dB (Crocker and Fratantonio, 2016). However, the developer has since informed NMFS that the survey team intends to use only the Geo Marine Geosource sparker and has clarified that it will be nominally operated with 400 tips and an energy of 400 J. Based on this, the most representative proxy equipment from Crocker and Fratantonio (2016) appears to be the Dura-Spark operating with 400 tips and 500 J, which was measured to have a source level of 203 dB. Notably, the SIG ELC 820 operating at 750 J and at a depth of 5 m (16.4 ft) also has a source level of 203 dB, according to Crocker and Fratantonio (2016). For these reasons, NMFS finds that the source level used in the analysis (203 dB) is appropriate for the planned activity and disagrees that any change to the analysis is necessary.

NMFS disagrees that the source level used in Project Company 1's sparker analysis is inconsistent with NMFS Greater Atlantic Regional Fisheries Office's (GARFO) 2021 ESA programmatic consultation for site assessment surveys. That analysis considered the loudest sources potentially used by all offshore wind developers conducting site assessment and site characterization surveys in the Atlantic Ocean due to its programmatic nature. Here, Project Company 1 has identified specific sources and operating modes and, therefore, our source level analysis is appropriate.

Comment 5: The commenter stated that NMFS' assumption on the spherical spreading and associated spreading loss factor was inaccurate as it calculates spreading beyond what could reasonably occur. They further stated that the 20 dB factor is presented without explanation or justification in equations in various reports, the transmission loss is not consistent with field measurements (Thomsen *et al.*, 2006), and the use of the 20 dB factor is not consistent with the NMFS approach used and described well as "common practice" in the NMFS' own ITAs from December 1, 2021 (86 FR 68223) and December 15, 2021 (86 FR 71162). They recommended that NMFS re-run the analysis, assuming a higher source level of the acoustic source (211

dB) and assuming a 15 dB transmission loss.

Response: In support of its position, the commenter cites several examples of use of practical spreading (a useful real-world approximation of conditions that may exist between the theoretical spreading modes of spherical and cylindrical; 15logR) in asserting that this approach is also appropriate here. However, these examples (U.S. Navy construction at Newport, Rhode Island, and NOAA construction in Ketchikan, Alaska) are not relevant to the activity at hand. First, these actions occur in even shallower water (*e.g.*, less than 10 m (32.81 ft) for Navy construction). NMFS notes that the transmission loss from field measurements referenced (Thomsen *et al.*, 2006) appear to be relative to impact pile driving. For a number of factors, transmission loss and therefore appropriate models depend on source characteristics. The commonly used convention, which is applied here by NMFS, is to use spherical spreading for HRG sources (Ruppel *et al.*, 2022). There is little data available regarding appropriate choice of spreading loss (or transmission loss coefficient) for HRG sources and sparkers in particular. However, the data that do exist for sparkers suggest that spherical spreading is a fair approximation; the field measurements by Rand (2023) imply spreading coefficients greater than 20 (22.5), field measurements from Halvorsen *et al.* (2018) are reasonably approximated by spherical spreading, and propagation modeling performed by Thomsen (2023) implies a transmission loss coefficient of 20.26. Thus, of the data that do exist, none suggest spherical spreading is a poor approximation. NMFS will continue to evaluate appropriate propagation models for this and other HRG sources as new data and literature become available.

Comment 6: The commenter criticized Project Company 1's use of the 2018 NMFS auditory weighting functions with the Wood *et al.* behavioral criteria as described in the JASCO modeling report, indicating the weighting functions are inappropriate. In addition, they claim that NMFS weighting functions for low-frequency cetaceans incorrectly assume that low-frequency cetaceans weighting functions eliminate most of the pile driving noise. They stated that the NMFS approach artificially underestimated take of low-frequency species as the underlying science was not intended to be used as such and that NMFS must re-estimate the exposure ranges and take using broader weighting functions (*i.e.*, Southall *et al.*, 2007). Lastly, they also

stated the NMFS' use of the 160 dB threshold for impulsive noise resulting from construction activities and vessel surveys is inconsistent by using the 160 dB threshold to assess vessel surveys and Woods *et al.* to assess construction activities. Overall, they say that this has resulted in NMFS underestimating the take associated with this Project and resulted in insufficient mitigation and monitoring zone sizes.

Response: These comments suggest there is confusion in understanding which thresholds were used for the analysis contained within the proposed and this final rule. For NMFS' analysis of behavioral harassment from pile driving and HRG surveys, we have appropriately relied on our 160 dB_{rms} sound pressure level (SPL) threshold, which is unweighted (*i.e.*, no sound is being eliminated), not the Wood *et al.* step function. Furthermore, we only rely on our 2018 weighting functions to assess the potential for auditory injury (*i.e.*, permanent threshold shift (PTS)). NMFS agrees with the commenter that the thresholds associated with Wood *et al.* are intended to rely on the broader M-weighting functions from Southall *et al.* (2007), not the weighting associated with our 2018 Technical Guidance.

Comment 7: Commenters have stated that NMFS underestimated take by Level A harassment (which the commenter asserts means "instances of serious harm or fatality") because the rule "does not estimate those" takes "that occur indirectly from Level B behavior disturbances." The commenters argue that HRG survey efforts in the Atlantic are causing recent whale strandings along the East Coast due to the overlap in time in which these events occur. The commenters claim that HRG surveys being performed for offshore wind development are the cause of recent U.S. East Coast strandings because literature and news reports document that seismic surveys using airguns, multibeam echosounders (MBES), and military sonar have been acknowledged previously as the cause of strandings worldwide. A commenter provided an Addendum to their letter wherein they describe that those sources used have similarities to the proposed HRG noise sources for the Project. All of the commenters thus claimed that HRG surveys conducted by Project Company 1 for the Project would result in whale strandings, including death.

Response: There is no evidence to support the assertion that serious injury or mortality is a reasonably anticipated outcome of Project Company 1's specified activities. Further, while NMFS acknowledges military active sonar and seismic airguns have been

associated with more severe effects, including strandings for military sonar in limited circumstances, these sources and operational parameters are very dissimilar to HRG surveys and their likely effects are not appropriately compared.

While NMFS acknowledges that HRG survey effort has increased in the Atlantic Ocean during the time period of increased whale strandings, there is no scientific evidence that HRG survey effort is a contributing factor to the strandings. NMFS does not agree that mortality is an anticipated outcome of these specified activities, and there is no evidence to suggest otherwise, as described below. Further, the proposed rule (88 FR 65430, September 22, 2023) clearly states that no serious injury and/or mortality is expected or was proposed to be allowed, and the same carries into the final rule for which no take by serious injury or mortality has been allowed (see also 50 CFR 217.302(c)). More specifically, we refer the commenters to the "Prohibitions" portion of the regulatory text (see 50 CFR 217.303). In the event that Project Company 1 takes any marine mammals in a manner that has not been authorized in the final rule (see 50 CFR 217.303), including mortality, these would be in violation of the MMPA and its implementing regulations and NMFS would undertake appropriate actions, as determined to be necessary (see 16 U.S.C. 1371(a)(5)(B)).

The best available science indicates that the anticipated impacts from site characterization and site assessment HRG surveys potentially include temporary avoidance of localized areas, cessation of foraging or communication, temporary threshold shift (TTS), stress, masking, *etc.* (as described in the Effects of the Specified Activities on Marine Mammals and their Habitat section in the proposed rule). NMFS emphasizes that there is no evidence that noise resulting from HRG surveys used for offshore wind development would cause marine mammal strandings, and there is no evidence linking recent large whale mortalities and currently ongoing offshore wind activities (*i.e.*, HRG surveys). The commenters offer no such evidence or other scientific information to substantiate their claim. This point has been well supported by other agencies, including the Marine Mammal Commission Newsletter, Spring 2023). Additionally, a recent paper by Thorne and Wiley (2024) reviewed spatiotemporal patterns of strandings, mortalities, and serious injuries of humpback whales along the U.S. East Coast from 2016–2022. Humpback whales were chosen as a case study for

this analysis as they are currently undergoing a UME and strand more often than other large whale species. Thorne and Wiley (2024) found vessel strikes to be a major driver in the increase of humpback whale strandings, mortalities, and serious injury along the East Coast. The potential for vessel strike increased during the study period due to increased vessel traffic in new foraging areas, the increased presence of juvenile humpback whales, and humpback whale foraging in shallow areas that overlap with vessel traffic. Based upon the spatiotemporal analysis, no evidence was found that offshore wind development played a role in the increased number of strandings over time. Future studies should focus on gaining a greater understanding of spatial and seasonal habitat use patterns of large whales, spatiotemporal changes in prey abundance and distribution, and how habitat use and foraging behavior affect the risk of vessel strike. While several species of delphinids and beaked whales have also stranded off New Jersey since 2011 (per data provided from the National Marine Stranding Network), there is no evidence that the acoustic sources used during HRG surveys contributed to these events. NMFS will continue to gather data to help us determine the cause of death for these stranded whales.

There is an ongoing UME for humpback whales along the Atlantic coast from Maine to Florida, which includes animals stranded since 2016, and we provide further information on the humpback whale and North Atlantic right whale UMEs in the Description of Marine Mammals in the Specific Geographic Region section of this final rule. For humpback whales, partial or full necropsy examinations were conducted on approximately half of the whales that were recently stranded along the U.S. East Coast. Necropsies were not conducted on other carcasses because they were too decomposed, not brought to land, or stranded on protected lands (*e.g.*, national and state parks) with limited or no access. Of the whales examined (roughly 90), about 40 percent had evidence of human interaction (*i.e.*, vessel strike or entanglement). Vessel strikes and entanglement in fishing gear are the greatest human threats to large whales. The remaining 50 necropsied whales either had an undetermined cause of death (due to a limited examination or decomposition of the carcass) or had other causes of death including parasite-caused organ damage and starvation. For North Atlantic right whales, starting

in 2017, evaluated mortalities were documented in both Canada and the United States, with the whales documented for this UME as being dead, injured, and/or sick to the extent that more than 20 percent of the population has been affected. The preliminary cause of mortality, serious injury, and morbidity (*i.e.*, sub-lethal injury and illness) in most of these whales is from entanglements or vessel strikes and human impacts continue to threaten the survival of this species. See NMFS' websites at: <https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2024-humpback-whale-unusual-mortality-event-along-atlantic-coast> and <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2024-north-atlantic-right-whale-unusual-mortality-event> for more information on the ongoing humpback whale and North Atlantic right whale UMEs. More information about interactions between offshore wind energy projects and whales can be found at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/frequent-questions-offshore-wind-and-whales>.

In their letters, the commenters referenced several papers documenting strandings associated with airguns and military sonars and cited several global events where animals stranded around the same time as these specific acoustic sources were used. They suggest that these sources are analogous to HRG sources used by Project Company 1. This is unsupported and inaccurate. High-powered seismic airguns and military sonars ensonify much larger areas than the lower-powered HRG survey equipment used in offshore wind activities, typically with distances to harassment thresholds on the order of several to 10s of kilometers, as opposed to the few hundreds of m to the 160-dB isopleth for the largest sources typically used in wind HRG surveys.

NMFS assessed the 10 monitoring reports submitted by authorization holders since 2021 for HRG activities (available on NMFS website) and found that overall and averaged across species, fewer than 9 percent of the individual marine mammals authorized for take were observed within the estimated Level B harassment zone (acknowledging that the true percentage is likely higher due to availability and perception bias), with no more than 21 percent of any species, and no North Atlantic right whales, observed within the Level B harassment zone of any survey. Furthermore, the most common behavioral response when the regulated sound sources were both active and

inactive was overwhelmingly "None". "Change Direction" (*i.e.*, which is broadly defined as "animal(s) alters orientation quickly, noticeably, or abruptly") was the second most frequent behavioral change observed, and also occurred during all source activity levels (per definitions commonly utilized in the *Mysticetus*TM software and based on other 90-day reports associated with oil and gas, geotechnical operations, and HRG operations (*e.g.*, Aerts *et al.*, 2008; Bles *et al.*, 2010; Lomac-MacNair *et al.*, 2014) and found within Appendix A of the final monitoring report associated with 84 FR 52464 (October 2, 2019)). The data demonstrates that individuals exhibited a change in pace more frequently when the acoustic source was active, as well as a change of pace and direction. Conversely, "Dive" (*i.e.*, broadly defined as "animal(s) abruptly moves completely below the surface") and "Look" (*i.e.*, broadly defined as "animal is watching the vessel, *e.g.*, spy hopping") were exhibited more frequently when the acoustic source was inactive.

Furthermore, a commenter references a 2008 stranding event of melon-headed whales in Madagascar, implying that a similar occurrence may be reasonably anticipated outcome of HRG survey work off of New Jersey. An investigation of the stranding event indicated that use of a 12-kHz MBES (a source unlike any planned for use by Project Company 1 or any other offshore wind companies on the East Coast) was the most plausible and likely initial behavioral trigger of the event (with the caveat that there was no unequivocal and easily identifiable single cause). The investigation panel also noted several site- and situation-specific secondary factors that may have contributed to the avoidance responses that led to the eventual entrapment and mortality of the whales (Southall *et al.*, 2013). Specifically, regarding survey patterns prior to the event and in relation to bathymetry, the vessel transited in a north-south direction on the shelf break parallel to the shore, ensonifying deep-water habitat prior to operating intermittently in a concentrated area offshore from the stranding site. This may have trapped the animals between the sound source and the shore, thus driving them towards the lagoon system. Shoreward-directed surface currents and elevated chlorophyll levels in the area preceding the event may also have played a role. The 12 kHz output frequency (generally in the middle of most marine mammal hearing ranges), significantly higher output power, and

complex nature of the system implicated in this event, in context of the other factors noted here, likely produced a fairly unusual set of circumstances that indicate that such events would likely remain rare and are not relevant to use of more commonly used lower-power, higher-frequency systems such as those evaluated for this analysis. Further, the MBES sources included in Project Company 1's activities are all 200 kHz or above (*i.e.*, beyond marine mammal hearing range) and significantly lower source levels than those used in the survey associated with the Madagascar event. Given this, marine mammals are not expected to hear the MBES sources used for the Project, which means that no behavioral response is anticipated, much less one that might be expected to contribute or lead to a stranding.

A commenter suggested a connection between the recent U.S. East Coast strandings and the site characterization surveys, citing different analyses and studies from other sound sources, and compared the source characteristics of sparkers to airgun arrays, arguing they are more similar than is captured by NMFS's respective analysis of these sources. NMFS acknowledges that both sparkers and airguns have wide ranges of configurations and potential source levels. However, low energy sparkers (analyzed as 500–600 J here) are significantly different from common airgun seismic surveys in many ways (*e.g.*, pulse duration, kurtosis, directionality, frequency content, source levels, and finally in how they are operated). In terms of sound levels, the maximum peak SPL measured for a similar sparker source in the field by Rand (2023) was 151.7 dB at a range of approximately 1 km (0.62 mi). The modeling methodology proposed here implies a peak SPL of 151 at 1 km (0.62 mi), using spherical spreading and a peak source level of 211 dB. In this case it is clear that both modeling and field data show that for similar sound sources the range to 150 dB is approximately 1 km (0.62 mi). By contrast, Martin *et al.* (2017) measured the distance to the 150 dB peak isopleth for a seismic survey to be 41.8 km (25.97 mi). Similarly, a seismic array analyzed for use in the Gulf of Mexico was modeled to have distances to the 160 dB_{rms} isopleth ranging between 7 to 24 km (4.35 to 14.91 mi) (Gulf of Mexico rule modeling found on NMFS' web page at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-oil-and-gas-industry-geophysical-survey-activity-gulf-mexico>), whereas the sparker is estimated by the modeling

here to have a 160 dB_{rms} range of 141 m (462.6 ft) and the measurement (Rand, 2023) was significantly below 160 dB at 1 km (0.62 mi).

The commenter further states that the frequency range of HRG sparkers likely overlaps that of mid-frequency sonar. Sparkers have a transmission frequency between approximately 300–1400 Hz (Ruppel *et al.*, 2022), and while NMFS agrees that this does overlap with the lower end of what is considered for mid-frequency sonar (mid-frequency sonar is typically defined as 1 to 10 kHz), the frequency content of the 2 sources are different. Further, the commenter acknowledges that mid-frequency sonars have a source level of 235 dB, which is significantly higher than typical source levels for sparkers. For these reasons, NMFS finds that comparison with mid-frequency sonar is not particularly useful in comparison of likely impacts to marine mammals.

Lastly, NMFS acknowledges that a commenter, in their Addendum, describes a study performed in the Gulf of Mexico in 2012 where the researchers suggested that the use of airguns in seismic surveys in the Gulf of Mexico may contribute to higher rates of stranding of several species of whale and dolphin. However, NMFS notes that the paper cited on this point is a paper by Pirotta *et al.* (2015) “Predicting the effects of human developments on individual dolphins to understand potential long-term population consequences.” Contrary to the commenters’ description, this paper does not discuss strandings or seismic surveys. Because the cited paper does not correspond to the study described in the comment and no other citation for the study is provided, NMFS is unable to respond to the findings of this study in context to our proposed rulemaking and MMPA action.

Comment 8: Commenters erroneously asserted that Level A harassment equates to instances of serious harm or fatality (*i.e.*, mortality) and that members of the public are opposed to offshore wind construction, including the Project, on the basis that it kills marine mammals. Additionally, a commenter also conflates any take by Level A harassment with Potential Biological Removal (PBR).

Response: NMFS reiterates that serious injury and/or mortality is not expected to occur as a result of Project Company 1’s planned activities, was not requested by the applicant, and NMFS is not allowing any through this final rulemaking. Furthermore, there is no evidence that construction of the Project will lead to mortality of marine mammals, especially given the rigorous

mitigation and monitoring measures NMFS requires Project Company 1 undertake.

Turning to the commenter’s second point, the commenter misrepresents PBR with the suggestion that it is applicable in the context of Level A harassment. The PBR level is defined as the maximum number of animals, not including natural mortalities, that may be removed from a stock while allowing that stock to reach or maintain its optimum sustainable population (16 U.S.C. 1362(20)). Thus, PBR is only germane in the discussion of “removals” (*i.e.*, serious injury or mortality) of individual marine mammals from the population and, therefore, PBR is not applicable in this discussion since no serious injury or mortality of any individuals is anticipated or allowed, as mortality has not been authorized.

Comment 9: Commenters stated that NMFS must provide more information on the predictions for serious harm and mortality expected by Level A harassment and Level B harassment. Specifically, commenters claim that HRG surveys are causing strandings while a commenter was concerned that Level B disturbances can lead to: (1) avoiding the noise or “standing off” from it in an undesirable direction or location, and in a migratory setting, obstructing or blocking it; (2) if the mammal is between the shore and the vessel source, being driven towards the shore seeking relief; (3) surfacing (demonstrated experimentally by Nowacek *et al.* (2003)) to seek a lower noise level and becoming more vulnerable to vessel strike; (4) the separation of mothers and calves due to the “masking” of their normal communications, which would be fatal for the calf; and (5) the loss of its navigational ability, cessation of feeding or mating, loss of energy and the ability to detect predators or oncoming ships.

Response: NMFS refers to its response to *Comment 7* above regarding the potential for HRG surveys to result in marine mammal mortality. With respect to the concern that Level B harassment could lead to harm or mortality, NMFS refers the reader to the description in the proposed rule (88 FR 65430, September 22, 2023) on Population Consequences of Disturbance (PCoD) models. NMFS recognizes that intense, prolonged and repeated behavioral harassment that disrupts key life behaviors could lead to impacts on reproduction or survival. However, as described in the proposed rule and the Negligible Impact Determination section of this final rule, the best available science indicates that behavioral

impacts to marine mammals from exposure to HRG surveys, and in consideration of the required mitigation measures, are not anticipated to result in energetic consequences that could lead to Level A harassment, impacts on reproduction or mortality. HRG surveys may result in low-level temporary behavioral disturbance such as slight avoidance of the source.

In addressing the comment related to masking of communications between mothers and calves, NMFS agrees that noise pollution in marine waters is an issue with the potential to affect marine mammals, including their ability to communicate when noise reaches certain thresholds. This was addressed, in detail, in the proposed rule in the Effects section (88 FR 65430, September 22, 2023). While the commenter does not specifically address what would cause the mortality of a calf in the event of a separation, NMFS assumes the commenter is referring to missed foraging nursing opportunities. Specifically related to HRG surveys, NMFS disagrees that the noise produced by HRG acoustic sources would be extensive enough to cause effects to the extent that these effects would cascade from minor behavioral impacts into mortality to the calf and has stated in both the proposed and final rules that only take equating to Level B harassment is expected to occur. While the scientific literature supports evidence of reduced vocalizations between a North Atlantic right whale mother-calf pair when at the calving ground, which is located much further south and outside of the Project Area (Parks and Clark, 2007; Parks *et al.*, 2019; Trygonis *et al.*, 2013), vocalizations between the pair are known to increase as the whales undertake their annual travel/migration behaviors to the northern foraging ground (also located outside of the Project Area) and as the calf matures (Cusano *et al.*, 2018; Root-Gutteridge *et al.*, 2018). NMFS refers the commenters to a paper by Videsen *et al.* (2017), which reports lower-level communication calls between humpback mother-calf pairs and noting the increased risk of cow-calf separation with increases in background noise. We first note that only neonates were tagged and measured in this study (*i.e.*, circumstances could change with older calves). Further, while vocalizations between these pairs are comparatively lower level than between adults, the cow and neonate calf are in regular close proximity (as evidenced by the extent of measured sound generated by rubbing in this study), which means that

the received levels for cow-calf communication are higher than they would be if the animals were separated by the distance typical between adults—in other words, it is unclear whether these lower-level, but close proximity, communications are comparatively more susceptible to masking. Furthermore, by making this comment, the commenter has not considered the movement of both the whale pair and the HRG acoustic sources as they relate spatially, and more specifically off of the New Jersey region which no primary foraging ground currently exists for North Atlantic right whales. While it is possible that North Atlantic right whale mother-calf pairs would pass through the Project Area during HRG survey campaigns, we expect that any overlap in occurrence between the isopleth from the HRG acoustic sources and North Atlantic right whale pairs would be brief, with the whales able to undertake minimal avoidance behaviors (*i.e.*, avoidance) to further reduce any impacts from the acoustic sources. In considering only the overlap between HRG surveys and North Atlantic right whale presence, the commenter is not accounting for the conservative mitigation measures implemented before and during HRG surveys, whereas the estimated isopleth size from the Geo-Marine GeoSource, the sparker that Project Company 1 is planning to use, and the acoustic source with the largest distance to the Level B harassment threshold is 141 m (462.6 ft). The Clearance, Shutdown, and Vessel Separation Zones for North Atlantic right whales are all 500 m (1,640 ft), over 3.5 times the size of the isopleth, providing a more protected zone whereas North Atlantic right whale pairs would not be close enough to the edge of the isopleth before mitigative actions would be undertaken (*i.e.*, shutdown or delay of using the acoustic source). Furthermore, any exposure to HRG acoustic sources would be expected to be minimal and fleeting, and most likely very easy for the whales to avoid the stimulus while experiencing minimal to no real effects. In understanding this very low likelihood of encountering cow-calf pairs, when combined with the fact that any individuals (or cow-calf pairs) would not be expected to be exposed on more than a couple/few days in a year, we expect that they would resume any previously interrupted behaviors quickly and with no long-term detrimental impacts.

Similarly, NMFS GARFO's 2021 programmatic consultation determined that the actions considered therein were

not likely to adversely affect any ESA-listed species or critical habitat and that, or the activities considered therein, no take is anticipated or exempted, as defined under the ESA (see <https://media.fisheries.noaa.gov/2021-12/OSW-surveys-NLAA-programmatic-rev-1-2021-09-30-508-.pdf>). With respect to any behavioral reactions from Project Company 1's activities resulting in increased risk of vessel strike, the commenter did not provide any evidence to support this conclusion. Marine mammals are subject to intense shipping traffic throughout U.S. East Coast waters (as demonstrated by UME data given vessel strikes are the primary cause of recent whale deaths in the Atlantic Ocean) and a slight deflection of migration or other movement patterns by whales in response to Project Company 1's activities does not necessarily mean risk would be increased. We note that GARFO's final Biological Opinion for the Project provided an evaluation of indirect vessel strike risk on marine mammals and found that, while avoidance and localized displacement behaviors are expected, these effects are expected to be temporary. Furthermore, even for those activities expected to be louder (*i.e.*, foundation impact pile driving) than those activities specifically discussed by the commenter (*i.e.*, HRG surveys), the Biological Opinion concluded that there is no expected avoidance behavior by a North Atlantic right whale from pile driving noise (or activities that produce quieter sounds) that would result in whales moving to areas with a higher risk of vessel strike. This determination was based on the relatively small size of the area with noise that an individual whale is expected to avoid (no more than 11 km (6.84 mi) from the pile being installed), the short-term nature of any disturbance, the limited number of whales impacted, and the lack of any significant differences in vessel traffic in that 11 km (6.84 mi) area that would put an individual whale at greater risk of vessel strike.

Comment 10: A commenter stated that NMFS should provide a description and rationale for the whale behavior assumptions being employed in JASCO's JASMINE model, otherwise NMFS should dispense with utilizing animal avoidance modeling in the ITA.

Response: The animal behavior attributes considered by JASCO in their JASMINE model are described in section 2.7 of JASCO's Underwater Acoustic Impact Assessment Report (see appendix B; https://media.fisheries.noaa.gov/2022-09/AtlanticShoresOWF_2022_

[Appendix%20B_OPR1.pdf](#)) and include behaviors as diving, foraging, aversion, and surface times. As described in the report, a subset of animal avoidance (called "aversion" in the text) scenarios were run for comparison purposes only (see page 24 in appendix B to section 2.7 of JASCO's Underwater Acoustic Impact Assessment Report) and were not considered in the exposure estimates calculated by JASCO that were used in this MMPA analysis.

Monitoring, Reporting, and Adaptive Management

Comment 11: Commenters stated that the proposed rulemaking overly relies on the use of PSOs and PAM to mitigate "harm" to marine mammals, claiming PSOs have a limited visual range of 1,500 m (4,921.3 ft) from an elevated platform or 1,000 m (3,280.84 ft) from a vessel bridge and that PSOs cannot observe North Atlantic right whales more than 5–10 ft (1.52–3.05 m) below the water's surface. They further state that PSOs would be even more limited during any nighttime pile driving, as there is no evidence that this specialized equipment is capable of allowing PSOs to detect whales in the dark at distances of more than a few hundred meters, and useless for North Atlantic right whales swimming at depth. The commenter also expressed concern over PAM limitations, including that PAM is effective only for calling animals, and that the probability of detection decreases with distance from the source and within increased background noise levels. To address these limitations, the commenter recommended PAM systems be deployed from multiple support vessels removed from the pile being installed and/or mono-buoys be placed strategically to operate and monitor in near-real time.

Response: NMFS disagrees that monitoring efforts (*i.e.*, using a combination of PSOs and PAM) will not be effective at detecting North Atlantic right whales such that injury or harm can be avoided. Commenters provided no evidence to support the presumed visual observation ranges. Project Company 1 is required to ensure that PSOs can visually monitor an area no smaller than the minimum visibility zone (1,900 m (6,233.6 ft)), which is more than the 1,500 m (4,921.3 ft) distance specified by the commenter. Pile driving may not occur in any conditions (*e.g.*, fog, rain, darkness) if PSOs are not able to sight marine mammals out to this distance. During construction of Vineyard Wind 1 and South Fork Wind, PSOs observed baleen whales at ranges as distant as 23 km

(75,459 ft) (RPS, 2024; South Fork Wind, 2024). NMFS recognizes distances out to which marine mammals may be observed are both species and weather dependent; however, the commenter did not provide evidence to support claims the minimum visibility zone could not be effectively monitored. Regarding PAM, the commenter cited a study titled “PAMguard Quality Assurance Module for Marine Mammal Detection Using Passive Acoustic Monitoring” (CSA Ocean Science, Inc., 2020), stating that PAM systems have a limited capability detecting marine mammals, especially low-frequency baleen whales, when the animal is not vocalizing, and that this may cause North Atlantic right whales to remain undetected prior to entering the Level A harassment zone, particularly because right whales often go “days or weeks without uttering a sound.” The commenters further described the findings of this study, specifically noting that the probability of detection varies, stating that PAM systems may have a “significant miss rate,” within any individual hour even if marine mammals are vocalizing, in some cases due to limitations related to “the operator’s ability to stay attentive and interpret the sound data produced by the monitoring equipment,” and that PAM systems are too easily masked by background noise. The study cited focuses on evaluating the relative performances of automated detectors and human analysts when tasked with identifying the occurrence of species-specific marine mammal call types in PAM data collected using a towed hydrophone array, thus the “miss rate” noted does not necessarily refer to the likelihood that a vocalizing marine mammal would not be detected on a given PAM system, but instead reflects variations in the ability of the automated detector or human analyst to detect a call if it is present in the PAM dataset. Developers are currently using a variety of PAM systems, including bottom-mounted hydrophone arrays and moored acoustic buoys, and assisted classification of received acoustic signals using automated detectors which minimizes strain on the PAM operator, thus reducing fatigue. This approach combines the strengths of both detector “types” (*i.e.*, human and software), by using automated detection software to cue a PAM operator’s attention to potential acoustic detections of a given species during real-time monitoring, which the operator can then probe to determine the context of the detection and verify the detection and classification.

The commenter does not provide any support for the claim that right whales are silent for days or weeks. Studies of right whale calling behavior (Davis *et al.*, 2017; Davis *et al.*, 2023; van Parijs *et al.*, 2023) indicate that, where acoustic buoys are deployed in known right whale habitat, upcalls (*i.e.*, a call type commonly produced by all age groups) are not only detected regularly (*i.e.*, many calls per hour) when right whales are expected to occur, based on known seasonal distribution patterns understood through visual observation and PAM data, but are also detected consistently during periods when right whales were not expected to occur (*e.g.*, in southern New England in winter). Both Davis *et al.* (2017) and Davis *et al.* (2023) provide evidence that upcalls were detected, at minimum, weekly throughout much of the U.S. Eastern Seaboard and Canadian Maritimes during periods when right whales were present (confirmed by visual observations), and in many cases, much more frequently. These and similar studies report on upcall detection patterns, but right whales frequently produce other types of vocalizations, such as tonal moans and downsweeps, thus increasing the likelihood of detection using PAM.

There are a wide variety of PAM systems available on the market (van Parijs *et al.*, 2021), ranging from omnidirectional independent acoustic buoys to multi-channel hydrophone arrays that are capable of detecting marine mammals in real-time. Barkaszi *et al.* (2020), the paper cited by the commenter focuses on characterizing marine mammal detection performance for towed PAM systems, which are typically most effective for monitoring mid- and high-frequency cetaceans and, to date, have not been proposed by offshore wind developers to monitor for marine mammals during foundation pile driving. While the specific PAM systems that would be used by Atlantic Shores South are still unknown, Atlantic Shores South is required to submit a Passive Acoustic Monitoring Plan (PAM Plan) to NMFS that demonstrates the system will be able to detect North Atlantic right whales at ranges up to 10 km (32,808.4 ft). To date, offshore wind developers have used bottom-mounted PAM systems located at distance from piles being installed. The proposed rule, and this final rule, require the PAM system be placed no closer than 1 km (3,280.8 ft) from the pile being installed to minimize masking of North Atlantic right whale calls by construction noise. We anticipate Project Company 1 would

use similar bottom-mounted recorders in lieu of PAM systems operated from vessels, as recommended by the commenter, particularly given the prevalence of masking of low-frequency sounds like North Atlantic right whale vocalizations by flow noise using towed PAM arrays (Barkaszi *et al.*, 2020; Thode *et al.*, 2021; van Parijs *et al.*, 2021).

Comment 12: Commenters stated that NMFS should disclose noise source levels at the 1 m (3.3 ft) and 750 m (2,460.6 ft) points, and the best fit noise transmission spreading loss and attenuation factors as recommended in the recent BOEM pile driving document recommendations.

Response: NMFS agrees that inclusion of source levels is important and notes decade band spectra are provided at 1 m (3.3 ft) for impact pile driving. Further, the decade spectra can be used to estimate broadband source levels. NMFS has performed this and the spectra corresponded to sound exposure level (SEL) source levels of approximately 227 dB for both 12-m and 15-m monopiles at hammer energies of 4,400 kilojoules (kJ). With regard to propagation loss, NMFS does not require best fit coefficients be included when more sophisticated propagation modeling is performed. However, such coefficients can be estimated from the acoustic ranges provided in the ITA application appendices.

Effects Assessment

Comment 13: Commenters requested that all incidental take issued across multiple ITAs for offshore wind projects be considered cumulatively from previous, ongoing, or potential projects and their specified activities. One commenter specifically suggested that not considering the impacts of both the Atlantic Shores North Project and this Project, that would collectively result in the installation of 357 WTG, leads to an underestimate of exposure ranges and take estimates. A commenter also stated that NMFS did not address the cumulative effects of turbine operation from this Project or others in the New York Bight area.

Response: Section 101(a)(5)(A) of the MMPA requires NMFS to make a determination that the take incidental to a “specified activity” will have a negligible impact on the affected species or stocks of marine mammals. NMFS’ implementing regulations require applicants to include in their request a detailed description of the specified activity or class of activities that can be expected to result in incidental taking of marine mammals (see 50 CFR 216.104(a)(1)). Thus, the “specified

activity” for which incidental take coverage is being sought under § 101(a)(5)(A) is generally defined and described by the applicant. Here, the activities are specific to Atlantic Shores South which is limited to the installation of up to 200 WTGs within the Lease Areas. Per the MMPA and per the ITA application received from the applicant, the findings and determinations in this proposed rule are limited to the Lease Areas for the Project (OCS-A-0499 and OCS-A-0570) and do not include Atlantic Shores North (which is lease area OCS-A-0549).

Neither the MMPA nor NMFS’ codified implementing regulations call for consideration of the take resulting from other activities in the negligible impact analysis. The preamble for NMFS’ implementing regulations (54 FR 40338, September 29, 1989) states, in response to comments, that the impacts from other past and ongoing anthropogenic activities are to be incorporated into the negligible impact analysis via their impacts on the baseline. Consistent with that direction, NMFS has factored into its negligible impact analysis the impacts of other past and ongoing anthropogenic activities via their impacts on the baseline (e.g., as reflected in the density/distribution and status of the species, population size and growth rate, UME status, and other relevant stressors). In this final rule, we also include a summary of the impacts from take authorized through other ITAs.

The 1989 final rule for the MMPA implementing regulations also addressed public comments regarding cumulative effects from future, unrelated activities. There, NMFS stated that in determining impact, NMFS must evaluate the total taking expected from the specified activity in a specific geographic area but that cumulative effects are not considered in making findings under § 101(a)(5) concerning negligible impact. In this case, this ITR, as well as other ITAs currently in effect or proposed within the specified geographic region, are appropriately considered unrelated to each other in the sense that they are discrete actions under § 101(a)(5)(A) issued to discrete applicants.

Through the response to public comments in the 1989 implementing regulations (54 FR 40338, September 29, 1989), NMFS also indicated: (1) that we would consider cumulative effects that are reasonably foreseeable when preparing a National Environmental Policy Act (NEPA) analysis; and (2) cumulative effects that are reasonably certain to occur would also be considered under section 7 of the ESA

for listed species, as appropriate. Accordingly, NMFS has adopted an EIS written by BOEM and reviewed by NMFS as part of its inter-agency coordination. This EIS addresses cumulative impacts on the human environment, including marine mammals, from past, ongoing, and future activities, including offshore wind and non-offshore wind activities that may affect marine mammals. Cumulative impacts regarding the promulgation of the regulations and issuance of a LOA for construction activities, such as those planned by Project Company 1, have been adequately addressed under NEPA in the adopted EIS that supports NMFS’ determination that this action has been appropriately analyzed under NEPA. Separately, the cumulative effects of Project Company 1 on ESA-listed species, including North Atlantic right whales, was analyzed under section 7 of the ESA when NMFS engaged in formal inter-agency consultation with the Protected Resources Division within NMFS GARFO. GARFO’s Biological Opinion for the Atlantic Shores South Project determined that NMFS’ promulgation of the rulemaking and issuance of a 5-year LOA for construction activities associated with leasing, individually and cumulatively, are likely to adversely affect, but not jeopardize, listed marine mammals.

Comment 14: A commenter stated that NMFS’ proposed rule (88 FR 65430, September 22, 2023) does not discuss the proposed turbine model or noise source level from a proposed turbine model. They also stated that NMFS underestimated operational turbine noises, as the proposed rule only presented impacts of low power and direct drive turbines.

Furthermore, the commenter stated that mothers and calves performing migration activities travel at slower speeds (i.e., approximately 25 percent of these could potentially experience SELs exceeding 199 dB), which would cause permanent hearing loss and that operational sound could lead to North Atlantic right whale cow-calf separation.

Response: Commenters specifically made claims based on a reanalysis from the operational noise source levels (181 dB (metric unknown)) for a Vesta-236 turbine model utilizing a monopile foundation (13.6 MW) that were estimated by extrapolating the broadband noise level trends versus turbine power using the Tougaard *et al.* (2020) and Stober and Thomsen (2021) papers. The commenters asserted that their estimate aligns with the value provided by a separate acoustics

company, XI-Engineering, who was commissioned by one of the commenters to determine the operational source level of a single Vesta-236 turbine (181 dB). A commenter stated that these papers show “the trend in noise source level versus increasing turbine power size for a frequency “spectral” component more indicative of the whale’s hearing range.” They further extrapolated the results from these 2 papers to yield an estimated operational source level of 192 dB for a single turbine. Based on their analysis, they have estimated a range of 61 mi (98.17 km) from shore for either 200 (the maximum number of WTGs planned for Atlantic Shores South) or 357 WTGs (this is inclusive of the maximum number of WTGs across both Atlantic Shores South and Atlantic Shores North, 2 separate Projects) where whales would experience noise levels above 130 dB_{rms}.

As described in the Potential Effects of Specified Activities on Marine Mammals and Their Habitat section in this final rule, the commenter’s analysis is not reflective of the best available science. Holme *et al.* (2023) demonstrated that the model presented in Tougaard *et al.* (2020) tends to potentially overestimate levels (up to approximately 8 dB) measured to those in the field, especially with measurements closer to the turbine for larger turbines and the authors found no relationship between turbine activity (power production, which is proportional to the blade’s revolutions per minute) and noise level. Moreover, Bellmann *et al.* (2023) note that no relationship between nominal WTG power and operational noise was observed, in contrast with the linear models used by Tougaard *et al.* (2020) and Stöber and Thomsen (2021). It is theorized that this is related to gearless and more modern WTGs measured as well as increased size and weight reducing transmission of vibrations. With regard to the extent of operational noise levels, Bellmann *et al.* (2023) concluded that tonal components of the operational noise are clearly observable at a range of 100 m (328 ft), but typically are not resolvable within the prevailing ambient noise at a range of 5 km (3.11 mi). Based on the best available science, the commenters’ calculations are flawed. Moreover, the commenter provided no evidence that exposure to operational turbine noise would prevent migration. In contrast, the proposed rule cited literature (e.g., Malme, 1983; 1984) supporting NMFS’ conclusions that the most likely response to noise from the Project would be temporary avoidance

or deflection responses from but not abandoning evolutionarily ingrained migratory behavior).

The swim speed analysis in the Hain *et al.* (2013) study that the commenters referenced only analyzed individuals within the North Atlantic right whale's traditional calving grounds in the Southeastern United States (SEUS) which is several hundred kilometers south of the Project Area. Mother-calf pairs have been documented as having extended stationary periods in the SEUS relative to other demographics as the pairs engage in critical development behaviors including nursing, "quiet contact", play, and rest (Hain *et al.*, 2013). However, mother-calf pairs have been shown to decrease their stationary behaviors as the calf ages and the pair migrate farther north (Cusano *et al.*, 2018). It is therefore likely that the pair's swim speeds may increase to some degree around the Lease Areas discussed here. Furthermore, out of 3 groups analyzed in this study (*i.e.*, mother-calf pairs, groups of 3 individuals or more, and single/pairs without a calf), mother-calf pairs did not have significantly different swim speeds from groups of 3 or more (average mother-calf swim speed = 1.20 km/hr. (0.75 miles per hour (mph)) +/- 0.76 km/hr. (0.47 mph) vs. 1.26 km/hr. (0.78 mph) +/- 0.50 km/hr. (0.31 mph) for groups of 3 or more). Only single/pairs of right whales without a calf had significantly higher swimming speeds (1.86 km/hr. (1.16 mph) on average, +/- 1.27 km/hr. (0.79 mph)) (Hain *et al.*, 2013). These results indicate that mother-calf pairs do not swim significantly slower than some other right whale demographics, and therefore do not have a disproportionately higher risk for permanent hearing loss as a result of their swim speed compared to the rest of the population.

Given that mother-calf pairs are capable of swimming equally as fast as other demographics, and that they reduce their amount of stationary time as the calf continues to grow and the pair moves farther north, it is unlikely that mother-calf pairs would be disproportionately exposed to noise to the level that could cause permanent hearing loss. Furthermore, calves/younger whales may spend more time at the surface; making them more visible to observers (*e.g.*, Baumgartner and Mate, 2003; Gero *et al.*, 2013; Lomac-MacNair *et al.*, 2018; Cusano *et al.*, 2019; Dombroski *et al.*, 2021).

Most importantly, NMFS also requires that Project Company 1's undertake enhanced mitigation and monitoring measures (*i.e.*, bubble curtains, PAM, use of experienced PSOs, seasonal

restrictions when North Atlantic right whales are more likely to be in and around the Project Area) to further reduce risks to North Atlantic right whale demographics (inclusive of any mother-calf pairs that may be migrating through the area), and expect that any harassment experienced by this species would be in the form of Level B harassment, and not Level A harassment. Furthermore, the Project Area is not one where this species is known to reside for long periods of time (*i.e.*, no extended residency as there is no foraging ground or calving ground off of New Jersey) and most animals would be expected to be migrating through the migratory corridor. Because of this, we disagree with the commenter's assertion as described in their comment letter.

Comment 15: A commenter stated that the rule needs to consider the increased risk to marine mammals from commercial and military vessel traffic being channeled into a 20 to 31 mile-wide (32 to 50 km) corridor between Atlantic Shores South's Lease Areas and planned projects in the Hudson South area given higher noise levels within the Project Area due to all WTGs becoming operational as well as overlap between pile driving activities of WTGs while other WTGs intermittently become operational. The commenter further stated that marine mammals attempting to travel within this corridor will incur an increased risk of vessel strike.

Response: As part of the Construction and Operations Plan (COP) for this Project, and then incorporated into the analysis in BOEM's final EIS, Project Company 1 was required to evaluate and draft a Navigation Safety Risk Assessment (NSRA; appendix II-S of the COP (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/2024-05-01_Appendix%20II-S%20Navigation%20Safety%20Risk%20Assessment.pdf)) to analyze the potential impacts of vessel traffic during construction, operation, and decommissioning of the Project and included considerations for commercial cargo vessels, military vessels, towing, fishing, and recreation vessels. Overall, the NSRA concluded that the construction of the Project as a whole will result in modifications to vessel traffic patterns, but that the risks associated with these changes would not be substantially different from consideration of Projects 1 or 2 or the whole of Atlantic Shores South. While some key commercial traffic waterways currently exist near the Wind Turbine Area (WTA) (*e.g.*, Ambrose-Barnegat Traffic Separation Scheme leading to and from New York), the NSRA

concluded that, given the distance away from the WTA to the south and far from this TSS, there are no expected impedances anticipated for commercial traffic in and out of this area. The NSRA further states that the Project is not anticipated to have an adverse impact to vessel traffic, even though some vessels (*e.g.*, commercial non-fishing vessels and military vessels) may choose to navigate around the Lease Areas rather than through it. However, although traveling through the Lease Areas would be generally restricted during the short construction period (*i.e.*, approximately 2–3 years) and may require non-Project vessels to transit through a narrower traffic route, vessels would be able to continue normal traffic patterns during the lengthy operations phase of the Project. Additionally, per the final EIS, the gridded pattern and appropriately marked lighting used for the WTGs, OSSs, and Met Tower is designed to improve vessel navigation, efficiency, and safety to allow for individuals to safely transverse through the Project Area.

Here, we discuss both pile driving activities and operations, as Project Company 1 has indicated that some WTGs may become operational during periods where others are continuing to be installed. As the commenter did not specify if the noise relates to all WTGs as operational or not, this review is more comprehensive. In looking at this information biologically, this is addressed, in part, in the final Biological Opinion (which also relied on and incorporated the data and conclusions of the NSRA) wherein NMFS GARFO stated that, while it is reasonable to expect pile driving activities to contribute to the avoidance and temporary localized displacement of ESA-listed whales (and, broadly, other non-ESA listed marine mammal species as well in and around the Project Area), NMFS concluded that we do not expect that any avoidance behaviors from pile driving would result in North Atlantic right whales being driven or moving to areas where there is a higher risk of vessel traffic. This determination was based on the relatively small size of the Project Area with noise that an individual whale is expected to avoid (no more than 11 km (6.84 mi) from the pile being installed), the short-term nature of any disturbance, the limited number of whales impacted, and the lack of any significant differences in vessel traffic in that 11 km (6.84 mi) area that would put an individual whale at greater risk of vessel strike. Regarding operations, NMFS has already included a detailed

description of operational noise from commissioned WTGs (see *Comment 14*). This discussion aligns with conclusions found within the Biological Opinion that state the area above ambient noise from operating WTGs is expected to be very small (*i.e.*, 50 m (164 ft) or less) and any effects to ESA-listed whales (and, broadly other marine mammal species) are likely to be insignificant. Regarding vessel density after construction activities have ended, information gleaned from the NSRA indicate that less vessels are needed during the operation and maintenance phase of the Project, and some vessels, such as fishing vessels, may choose to continue transiting through the WTA, especially given known reef effects when hardened structures are installed into softer sediment environments (see Langhamer, 2012; Stenberg *et al.*, 2015; Degraer *et al.*, 2020; and Gill *et al.*, 2020 for some examples) which would reduce any areas of higher vessel densities outside the WTA that would have existed during the construction period where avoidance of the WTA occurred (although the NSRA indicates this vessel density would not increase substantially even during the construction period, with a minor increase to the east of the WTA). This indicates that, given the already high level of vessel traffic experienced off of New Jersey, these changes would be minimal and temporary, with very little chance to lead to additional opportunities for vessel strikes of whales.

Lastly, as the commenter specifically points out projects planned in the Hudson South Call Area, those 6 projects (*i.e.*, Bluepoint Wind, LLC (OCS-A 0537); Attentive Energy LLC (OCS-A 0538); Community Offshore Wind, LLC (OCS-A 0539); Atlantic Shores Offshore Wind Bight, LLC (OCS-A 0541); Invenergy Wind Offshore LLC (OCS-A 0542); and Vineyard Mid-Atlantic LLC (OCS-A 0544)) are still in the early coordination phase with no construction activities currently planned in the next 5 years that would overlap with the effective period of Project Company 1's rulemaking. As these projects have not even finalized the process to become FAST-41 projects, NMFS does not expect that any construction activities for those lease areas are forthcoming within the effective period of Atlantic Shores South; therefore, no military or commercial vessels would be restricted into a narrow vessel traffic route nor would any whales experience an increased risk of vessel strike when navigating outside of the Project Area

for Atlantic Shores South, per the narrow channel referenced by the commenter.

NMFS acknowledges that whales may temporarily avoid the area where the specified construction activities or noise from operational WTGs occurs and this was broadly addressed in the proposed rulemaking. However, for the reasons described above, NMFS does not anticipate that whales will be displaced in a manner that would result in a higher risk of vessel strike, and the commenter does not provide evidence that either of these effects should be a reasonably anticipated outcome of the specified activity. Generally, vessel traffic in this region is concentrated closer to shore as vessels leave and return to the coastal ports. The density of vessel traffic dissipates as one moves offshore. The commenter has presented no information supporting the speculation that whales would be displaced from the Project Area into shipping lanes, areas of higher vessel traffic, or a specific corridor in a manner that would be expected to result in higher risks of vessel strike.

Other

Comment 16: Commenters expressed concern that operational turbines could harm or kill marine mammals if they migrated through the Atlantic Shore South and Hudson South wind areas and that operational noise would impair the echolocation and navigation ability of North Atlantic right whales, increasing risk of predation and vessel strike, and compromise a North Atlantic right whales ability to make it through the corridor. Other commenters expressed similar concern for dolphins and other species that can echolocate.

Response: Baleen whales (*e.g.*, humpback whales, minke whales) do not have the ability to echolocate, a process by which toothed whales (*e.g.*, sperm whales) and dolphins emit high-frequency sounds from their melon to obtain information about objects (typically prey) in the water. Because baleen whales do not echolocate like toothed whales and dolphins, there is no concern over impeding such ability. All large whales that have stranded along the U.S. East Coast since December 2011, with the exception of 3 sperm whales, have been baleen whales.

With respect to toothed whales and dolphins, the low frequency operational noise is not anticipated to impact echolocation. The frequency of echolocation clicks is dependent on their need; however, clicks would be outside the frequency range of operational noise (with some clicks being ultrasonic) typically around 30–

100 kHz (Southall *et al.*, 2019; Kuroda *et al.*, 2020) and can be very loud (up to 200 dB peak-to-peak) (Brinklöv *et al.*, 2022). In contrast, operational turbine noise is generally below 1 kHz (Tougaard *et al.*, 2020; Stöber and Thomsen, 2021). Therefore, turbine noise interference with echolocation is not a likely outcome of exposure.

Operational noise is also not anticipated to interfere with North Atlantic right whale navigation or migration. During the effective period of the rule, some or all of Atlantic Shores' proposed turbines will become operational. The proposed rule included an evaluation of operational noise impacts on marine mammals, including North Atlantic right whales and described anticipated noise levels from operation. For example, the proposed rule indicated that operational noise levels are likely lower than those ambient levels already present in active shipping lanes, such that operational noise would likely only be detected in very close proximity to the WTG (Thomsen *et al.*, 2006; Tougaard *et al.*, 2020). North Atlantic right whales are well known to transit through heavily used shipping lanes wherein commercial vessels (as well as recreational vessels) continuously elevate background noise levels. The commenter did not provide any scientific support to their statements that navigation and echolocation would be impaired due to operations so NMFS was unable to evaluate these statements further.

Comment 17: A member of the public has stated that the work planned for Atlantic Shores South would interfere with the North Atlantic right whale's "migration and reproduction territory" and that NMFS should not issue any ITAs to allow for any type of harassment to marine mammals, particularly those listed under the ESA.

Response: NMFS disagrees that the Atlantic Shores South Project would interfere with the "migration and reproduction territory" of the North Atlantic right whale, as suggested by the commenter. NMFS is aware of no evidence to support this claim, nor did the commenter provide any. The migratory Biological Important Area (BIA) is about 177.77 km (101.46 mi) across where the Atlantic Shores South Project (26.4 km (16.4 mi)) intersects and given that the Project Area overlaps approximately less than 15 percent of the width of the migratory corridor, the Project Area is not expected to meaningfully impede the movement of migrating North Atlantic right whales. This information is all publicly available and this analysis can be easily

replicated and visualized through data found in NOAA's Marine Cadastre National Viewer at: <https://marinecadastre.gov/viewers/>. No take by injury, serious injury, or mortality is authorized for the species. NMFS emphasizes that the authorized incidental take of North Atlantic right whales is limited to Level B harassment (*i.e.*, behavioral disturbance). As described in the proposed rule and this final rule (see Negligible Impact Analysis and Determination section), NMFS has determined that the Level B harassment of North Atlantic right whales will not result in impacts to the population through effects on annual rates or recruitment or survival.

Furthermore, no calving habitat or reproductive areas are known off of New Jersey and the BIA for this area is located off the southeast U.S. coast, extending from the Cape Fear, North Carolina to below Cape Canaveral, Florida (calving critical habitat; <https://www.fisheries.noaa.gov/species/north-atlantic-right-whale>). These 2 areas are approximately 712 km (443 mi) apart (assuming a straight line that intersects land), from the most southern point of the Lease Areas to the most northern point of the calving area. Therefore, NMFS does not expect that reproductive activities located in the southeast would be affected by the activities occurring off of New Jersey for the Project.

Lastly, the commenter seems to have a misconception about how the MMPA and ESA work together. Under section 7(a)(2) of the ESA, Federal agencies are required to consult with NMFS or the U.S. Fish and Wildlife Service, as appropriate, to ensure that the actions they fund, permit, authorize, or otherwise carry out will not jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitats (16 U.S.C. 1536(a)(2)). For the Atlantic Shores South Project, our office (*i.e.*, the Office of Protected Resources) requested initiation of a section 7 consultation for ESA-listed species with the NMFS Greater Atlantic Regional Fisheries Office on July 19, 2023. A Biological Opinion was completed on December 18, 2023 (see <https://www.fisheries.noaa.gov/s3/2024-02/GARFO-2023-01804.pdf>), which concluded that the promulgation of the rule and issuance of a LOA thereunder is not likely to jeopardize the continued existence of threatened and endangered species under NMFS' jurisdiction and is not likely to result in the destruction or adverse modification of designated or proposed critical habitat. Because of this, NMFS' action of finalizing the rulemaking and issuing a LOA for the

Atlantic Shores South Project is consistent with the ESA.

Comment 18: The Commission stated concern regarding discrepancies between modeled and measured zones as factors to take into account for rule conditions and recommended that NMFS provide the interim SFV reports for the South Fork and Vineyard Wind 1 projects and allow for another 30-day public comment period for the Atlantic Shores South proposed rule before issuing any final rule.

Response: NMFS disagrees that results from the South Fork and Vineyard Wind 1 projects are necessary for the public to comment on the Atlantic Shores South proposed rule. The public had adequate opportunity to comment on the acoustic modeling methods and results in the proposed rule and supporting information, including a detailed acoustic modeling report. Moreover, *in situ* data on pile driving, in general, including from the Block Island Wind Farm and Coastal Virginia Offshore Wind (CVOW) Pilot Project are publicly available and were described in the proposed rule as well as modeling that has investigated how source levels may increase in relation to pile and hammer specifications. Since that time, NMFS made the Vineyard Wind 1 SFV report available on its website as this report was deemed final. South Fork Wind has not yet submitted a SFV report that NMFS has deemed final; therefore, it is not available. Waiting until the South Fork SFV report is available and opening another 30-day public comment on the Atlantic Shores South proposed rule could constitute an unnecessary delay to the environmental permitting process and would not be aligned with the FAST-41. NMFS has reviewed the final monitoring reports submitted for the South Fork and Vineyard Wind 1—Phase 1 Projects and the results do not conflict with modeled assumptions and estimated/allowed take included in the rule. Further, marine mammal monitoring results indicate that observed behaviors from pile driving activities are in line with NMFS' analysis and assumptions within the NID (*i.e.*, behaviors of mysticetes included surfacing, blowing, fluking, and feeding, which are expected but not strong reactions to a noise stimulus and indicative of low levels of Level B harassment). For all these reasons, NMFS is not re-publishing the Atlantic Shores South proposed rule for public comment.

NMFS acknowledges the Commission's concern regarding potential discrepancies between modeled and measured ensonification zones and has made certain changes

within 50 CFR 217.304, including the addition of paragraph (c)(14)(viii)(A), to ensure that a flexible, iterative process is available to the agency in addressing any such discrepancies.

Comment 19: The Commission recommended that NMFS ensure that the mitigation, monitoring, and reporting requirements for the construction of wind energy facilities are sufficient at the conclusion of the final rule phase and that by allowing additional sound attenuation technologies to be implemented, as needed, during Project construction could lead to delays and additional impacts to marine mammals if delays necessitate longer construction periods.

Response: NMFS understands the suggestion by the Commission but disagrees at this time. Within U.S. waters, offshore wind is relatively new and brings with it new science, technology, and data. To fully ensure conservation benefits to NOAA's trust species, we believe that all mitigation, monitoring, and report approaches are necessary to be both proactive and reactive through our Adaptive Management condition found within the final rulemaking framework and LOA. Ideally, the Commission is correct and all mitigation, monitoring, and reporting requirements should be consistent and appropriate throughout the entire process, especially at the proposed rule stage. However, this suggestion by the Commission disregards the updated and improved knowledge and data obtained from each project as it completes permitting and enters the construction and operations period. As our knowledge and experience with all offshore wind projects continues and further improves, NMFS welcomes the ability to update and improve mitigation and monitoring measures, given the influence of new and additional data.

While the Commission is correct that necessitating additional sound attenuation technologies, as needed, may cause delays, NMFS sees these adjustments as necessary to ensure that the Project is being constructed in an adaptive way that ensures sufficient protection of marine mammals. Specifically, we note the concern raised by the Commission wherein delays could lead to additional impacts to protected species "if delays necessitate longer construction periods" is without merit. As described within the proposed rule, and subsequently carried into the final rule, NMFS has considered situations where the construction schedule could experience delays due to weather or supply chain issues (also more broadly including changes to the implementation of the Project) and has

noted that, given the maximum construction Schedule analyzed for the Atlantic Shores South Project, we do not expect the maximum 5-year take to exceed that which is authorized in the LOA. Additionally, the seasonal restrictions designed to provide additional protections to North Atlantic right whales (*i.e.*, January through April) are implemented annually throughout the entire effective period of the final rulemaking and LOA. If foundation pile driving is delayed into this seasonal shoulder, activities would only be allowed to continue once the restriction period has ended (*i.e.*, after April 30th), when North Atlantic right whales are less likely to be in the Project Area. Because of this, we do not expect that any marine mammals would be impacted during times of year where the effects were not already analyzed.

Comment 20: The commenter suggests that NMFS is using an arbitrary percentage (*i.e.*, 33) to represent “small numbers” when a smaller percentage (*i.e.*, 12) would be more appropriate, per a Court decision. The commenter also seems to be arguing that given the number of takes by harassment predicted and authorized for North Atlantic right whales, a take by serious injury or mortality is therefore likely to occur, and that that would be inconsistent with the criteria of less than 1 serious injury or fatality for the North Atlantic right whale (*i.e.*, referencing specifically the PBR). The commenter further goes on to say that this is a clear violation of the small numbers determination and the negligible impact criteria.

Response: NMFS has provided a reasoned approach to small numbers, as described in full in the final rule, “Taking Marine Mammals Incidental to Geophysical Surveys Related to Oil and Gas Activities in the Gulf of Mexico” (86 FR 5322 at 5438, January 19, 2021). Utilizing that approach, NMFS has made the necessary small numbers finding for all affected species and stocks in this case (see the Small Numbers section of this preamble for more detail). The commenter also cites *NRDC v. Evans*, 279 F.Supp. 2d 1129 (N.D. Cal. 2003), for the proposition that a standard less than 12 percent is required for the “small numbers” analysis. The commenter’s reading of that case is inaccurate. In *Evans*, the court ruled that the negligible impact determination and the small numbers analysis must be undertaken separately, but the court specifically “does not require defendants to set an absolute numerical limit” for small numbers (*Id.* at 1152). Following that case, NMFS undertook separate small numbers

findings from its negligible impact determinations, analyzing in each case whether the numbers were small relative to the stock or population size (the “proportional approach”). NMFS’s proportional approach has been recently upheld as a reasonable interpretation of the relevant statutory provision (see *Melone v. Coit*, 100 F.4th 21, 30–31 (1st Cir. Apr. 25, 2024)).

Regarding the assertions that serious injury or mortality will result from the activity given the number or authorized takes by harassment, the mathematical arguments presented by the commenter are unsupported and no evidence supporting the likelihood or serious injury or mortality is presented. NMFS has provided extensive explanations for why these activities are not expected to result in serious injury or mortality of North Atlantic right whales (see *Comments 7, 8, 9, and 17*) and also provided a robust rationale supporting the negligible impact determination for North Atlantic right whales and all marine mammal species in the Negligible Impact Analysis and Determination section of the final rule.

Comment 21: A commenter stated that NMFS omitted important impacts of this Project, including impacts from Project decommissioning. The commenter also stated that the proposed rule did not address why UXOs/MECs were not analyzed in this action, even though they were present in the action of a neighboring lease (*i.e.*, Ocean Wind 1, OCS-A-0498).

Response: Given that the average lifespan of offshore wind turbines is about 20–35 years, decommissioning would occur after this 5-year rule expires and therefore was not included as a specified activity in Atlantic Shore’s application. Because of this, decommissioning is not an activity subject to the MMPA analysis contained herein. Similarly, Project Company 1 does not plan to detonate UXO/MECs for this Project, did not include it as part of the specified activities in the application or request to take marine mammals incidental to the detonation of UXO/MECs, and NMFS did not propose detonation of UXO/MECs.

Comment 22: A commenter, in many of their comments, referenced an analysis for 357 WTGs, which is inclusive of 2 separate projects: Atlantic Shores North and Atlantic Shores South.

Response: NMFS notes that the commenter erroneously describes the total possible Project Design Envelope for 2 separate projects: Atlantic Shores South ($n=200$ WTGs) and Atlantic Shores North ($n=157$ WTGs). NMFS’ action for which the proposed rule was

published is over the Atlantic Shores South and did not include the Atlantic Shores North project. NMFS is required to consider applications upon request, and the MMPA does not provide NMFS with authority to dictate an applicant’s definition of its specified activity (*e.g.*, separation/combination of construction activities across multiple lease areas or projects with the developer, *etc.*). An individual company owning multiple lease areas may apply for a single ITA to perform construction or conduct site characterization surveys across a combination of those lease areas, if they so wish, such as some HRG survey activities conducted by Orsted, or may request a single ITA for a single project area or lease area, both cases which may be found on NMFS’ website at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>. For Atlantic Shores South, NMFS did not receive a joint application for both South and North, only for South and the Lease Areas (*i.e.*, OCS-A-0499 and OCS-A-0570). While an individual company owning multiple lease areas may apply for a single ITA to conduct their activities across a combination of those lease areas, this is not applicable in this case. In the future, if applicants wish to undertake this approach, NMFS is open to the receipt of joint applications and additional discussions on joint actions. However, for NMFS’ action as described here, the applicant, Project Company 1, requested an ITA for Atlantic Shores South, and that is what NMFS’ analysis herein describes.

Comment 23: Commenters stated that NMFS has failed to fulfill its obligations under the NEPA and the ESA. Regarding NEPA, the commenters stated that because the Project constitutes a major Federal action, it must be supported by an EIS and NMFS must either prepare its own or work with BOEM as a cooperating agency to the preparation of an EIS. They further expand that, to be consistent with NEPA, the MMPA ITA review must be coordinated with the EIS review to the “maximum extent possible”, which the commenter interprets as the proposed rule being released for public comment alongside the draft EIS so the public has the ability to evaluate both documents and the final MMPA rulemaking being released at the same time as the final EIS. The commenter also stated that the proposed MMPA ITA publication should be accelerated or the draft EIS should be delayed until both documents are ready (and the commenters stated May 2023 as that date).

Additionally, the commenter stated that, per BOEM's new NEPA policy, only projects that have been already approved by the State should be analyzed and carried forward. Given the State of New Jersey has not approved Project 2 (at the time of drafting this final rulemaking), the scope of the MMPA ITA application should be limited to Project 1 only. The commenter then states that they believe BOEM's new NEPA policy to be inherently flawed and too limiting in scope.

Regarding the ESA, the commenters have stated that the Notice of Availability of the EIS makes no mention of compliance with the ESA and that the section 7 consultation should have been coordinated with the NEPA EIS and the MMPA ITA process. They also state that the Biological Assessment should be made publicly available at the same time as the draft EIS and the proposed rulemaking (in alignment with their suggestions for the MMPA/NEPA schedule) so the public can review all documents in the appropriate context.

Given the explanation above, the commenters recommend that if these suggestions are not followed, NMFS deny the Project an ITA and engage in further discussions with BOEM and the applicant to terminate the Project. Alternatively, they suggest that if the Project isn't terminated, it should be reduced in scope to allow for unimpeded use of the migratory corridor for North Atlantic right whales.

Response: NMFS has met its obligations under both NEPA and the ESA for the issuance of the MMPA final rule, in that all required procedural steps have been followed, and the necessary findings have been made to support the issuance of the final rule. NMFS agrees that the planned Project, as described, constitutes a major Federal Action and therefore requires an evaluation under NEPA. In compliance with NEPA, BOEM published a Notice of Intent (NOI) to prepare an EIS for the Atlantic Shores Offshore Wind Projects (*i.e.*, Atlantic Shores South) (86 FR 54231; September 30, 2021), which is found on BOEM's web page at: <https://www.boem.gov/renewable-energy/state-activities/atlantic-shores-south>. In alignment with this NOI, BOEM published both a Notice of Availability of the draft EIS (88 FR 32242, May 19, 2023) and the draft EIS itself on their web page and opened a public comment period soliciting public input on the Project and draft EIS for a 60-day public comment period (noting that the commenter provided comments on the draft EIS, per appendix N of the final

EIS) (see <https://www.boem.gov/renewable-energy/state-activities/atlantic-shores-offshore-wind-south-final-environmental-impact>).

We disagree with the commenter's statement that NMFS has failed in its obligations under NEPA. NMFS has been a cooperating agency working with BOEM on the EIS since October 18, 2021, when BOEM transmitted a request to join the Project as a cooperating agency. NMFS participated and provided several reviews of the draft and final EIS' as they relate to our trust species and resources, and coordinated with BOEM, as the lead agency, as needed. NMFS disagrees with the commenters' comment that the draft EIS should be released concurrently and during the same time period as the proposed MMPA ITA, the final EIS should be released at the same time as the final MMPA ITA, and that the timeline for the MMPA ITA should be sped up, in this case, to align with the timeline for the final EIS. The current FAST-41 schedule allowed sufficient time for both the draft EIS and the proposed MMPA ITA to be evaluated, before either were finalized, and provided a publicly available timeline for this regulatory action. Nothing in the MMPA, ESA, or NEPA requires or suggests the timing adjustments described by the commenter. Lastly, the commenter fails to provide a basis for suggesting the May 2023 date and, as stated above, NMFS disagrees with timeline adjustments as presented by the commenter. The relevant regulatory processes have followed typical timelines for such actions and properly incorporated public comment.

As to the commenter's second point regarding NEPA and BOEM's approval of one or both of the projects described for Atlantic Shores South, NMFS does not have authority over BOEM processes or guidance, nor do we have authority to allow for Project activities to go forward or to be rejected, as that is outside the scope of our MMPA authority. Within the scope of our MMPA authority is to analyze, and if specific findings are met, allow for a limited amount of take to occur to marine mammals from specified activities in the ITA application. Any questions specific to BOEM's policies should be directed at the appropriate agency.

Commenters also identified concerns regarding a lack of text in the NOA of the draft EIS and that the section 7 consultation under the ESA should have been coordinated with the NEPA EIS and MMPA ITA processes. Regarding the MMPA ITA, NMFS met its requirements under the ESA through the

initiation of the section 7 consultation of the ESA on July 19, 2023, as described in the proposed rulemaking. As required under NEPA and the ESA, BOEM provided a Biological Assessment to NMFS GARFO. Any other comments or discussions regarding timing and alignment between NEPA and the ESA are out-of-scope for the NMFS MMPA action and should be taken to the appropriate agencies (*i.e.*, BOEM) and offices (*i.e.*, NMFS GARFO). Additionally, the commenters' statement that the Biological Assessment should be made publicly available at the same time as the draft EIS, is unfounded and out of scope of NMFS' MMPA action. Our response to the commenter's suggestion on schedule alignment is set forth above.

Finally, the commenters propose termination of the Project if these alignment concerns are not addressed, or in the alternative, a reduction in the scope and size of the Project to allow for the unimpeded use of the migratory corridor by North Atlantic right whales. Again, termination of the Project is outside the scope of NMFS's authority, and outside the scope of this MMPA action. The commenters provide no substantive reasoning why NMFS should refuse to promulgate a final rulemaking. As previously described, the MMPA is an applicant-lead process and NMFS analyzes the scope of a project, as proposed by an applicant.

Comment 24: Commenters requested that NMFS provide information that can be used to identify the wind turbine installation vessel.

Response: NMFS agrees with the commenter that identification information for the vessels used in the Project (and more broadly for all offshore wind projects) is important. As described in the proposed rule (88 FR 65430, September 22, 2023), and carried over into the final rule, NMFS requires that all vessels working on the Atlantic Shores South Project utilize an Automatic Identification System (AIS) and Project Company 1 is required to provide the Marine Mobile Service Identity (MMSI) numbers to NMFS, per the requirements described under this final rule in *Vessel Strike Avoidance Measures* section, located in the Mitigation section, as well as within the final regulations conditions under 50 CFR 217.304(a)(11) and § 217.305(g)(14)(v). These vessels will be available to be publicly viewed on a number of free AIS tracking websites, including but not limited to: <https://www.marinetraffic.com> and <https://www.vesselfinder.com>.

Changes From the Proposed to Final Rule

Since the publication of the proposed rule in the **Federal Register** (88 FR 65430, September 22, 2023), NMFS has made changes, where appropriate, that are reflected in the preamble and regulatory text of this final rule. These changes are briefly identified below, with more information included in the indicated sections of the preamble to this final rule.

Changes to Information Provided in the Preamble

The information found in the preamble of the proposed rule was based on the best available information at the time of publication. New information is constantly becoming available and is intentionally solicited during the public comment period. NMFS works to ensure the best available science is included in every stage of the regulatory process. Since publication of the proposed rule, new information related to the effects of the activity on marine mammals has become available and has been summarized and considered in this final rule. As discussed below, while new information has added detail to our understanding of the impacts of the activity on marine mammals and their habitat, and in some cases minor changes or clarifications have been made to the narrative supporting the analysis or the mitigation and monitoring measures as a result, the inclusion of this new information has not resulted in substantive changes from any of NMFS' determinations in the proposed rule.

Throughout the rule, and in the Summary of Request section, given the request from the applicant to change ownership of Atlantic Shores South and the lease segregation, we have updated the name of the applicant and lease numbers, where appropriate.

The following changes are reflected in the *Description of Marine Mammals in the Specified Geographic Region* section of the preamble to this final rule:

Given the release of NMFS' draft 2023 Stock Assessment Reports (SARs) (<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>), we have updated the stock abundance estimates for several species and stocks, including: North Atlantic right whales (which also includes the Linden (2023) estimate, as incorporated into the draft 2023 SARs), sperm whales, Atlantic spotted dolphins, bottlenose dolphins (Western North Atlantic—offshore stock), common

dolphins, short-finned pilot whales, Risso's dolphins, harbor porpoises, and gray seals. These revised abundance estimates have been incorporated into the tables (where applicable), and into the Negligible Impact Analysis and Determination section and Small Numbers section in this final rule.

In alignment with the new draft 2023 SARs, we have updated the total North Atlantic right whale total mortality/serious injury (M/SI) amount from 8.1, as shown in the proposed rule, to 27.2. This accounts for 27.2 total mortality, 17.6 of which are attributed to fishery-induced mortality, per the footnote in the draft SAR. This increase is due to the inclusion of undetected annual M/SI in the total annual serious injury/mortality estimate. As described above, no M/SI of North Atlantic right whales is anticipated or has been authorized for the Project.

Given the availability of new information, we have made updates to the UME summaries for the described species (*i.e.*, North Atlantic right whales, humpback whales, minke whales, and phocid seals).

Within the Potential Effects of Specified Activities on Marine Mammals and Their Habitat section, we have made the following additions:

We have added additional information regarding operational noise from WTGs, given the release of new scientific literature.

We have added information relating to the broken blade at the Vineyard Wind 1 lease area (OCS-A-0501), the rarity of this event occurring, and that no take was requested, proposed, or authorized incidental to blade failure so this isn't discussed further in this document.

The following changes are reflected in the *WTG, OSS, and Met Tower Foundation Installation* subsection of the Estimated Take section of the preamble to this final rule:

Due to a public comment received during the 30-day comment period associated with the proposed rule, NMFS agrees that the broadband source level is important information to include. Using the decidecade spectra included in the application, we have calculated and included the SEL source levels for 12-m and 15-m monopiles using hammer energies of 4,400 kJ and found that they are approximately 227 dB.

After additional review of the application materials, NMFS noted a transcription error in table 15 of the proposed rule where the incorrect distances were presented for the acoustic ranges ($R_{95\%}$) for sites L01 and L02. The correct ranges are shorter than

those in the proposed rule. This has been corrected in the final rule in table 13; however, recognition of this error does not change our measures or findings.

The proposed rule contained the correct take numbers from foundation pile driving for Project 1 and Project 2, individually (tables 17 and 18 in the proposed rule and tables 15 and 16 of this final rule). However, in developing this final rule, NMFS recognized that the takes from Project 2 were not appropriately added to the takes from Project 1 in Year 2 (when a limited number of WTG foundations from Project 2 may occur in the same year as Project 1, as shown in Tables 17 and 18 of the proposed rule). The final rule corrects the sum of the total take each year and over the 5-year period. This action changes some of the take estimates found in table 17 of this final rule (table 19 of the proposed rule) and tables 22, 23, and 24 of this final rule (tables 24, 25, and 26 in the proposed rule), but did not affect or change NMFS' overall final determinations for this rulemaking described in the proposed rule. Furthermore, this update does not change the number of WTGs fully analyzed in the take analysis ($n=200$ WTGs). Where applicable, in the final rule, these updates have also been addressed in the Negligible Impact Analysis and Determination section and for the small numbers finding in the Small Numbers section.

The following change is reflected in the *Cable Landfall Activities* subsection of the Estimated Take section of the preamble to this final rule:

To provide additional context to the proximity to shore for the temporary cofferdam activities, NMFS has added additional information regarding known haul-out locations of pinnipeds in New Jersey and a brief discussion on why we do not expect any harassment from in-air noises.

The following changes are reflected in the *HRG Surveys* subsection of the Estimated Take section of the preamble to this final rule:

Given new information on the sparker acoustic source planned for use during HRG surveys, as provided by the applicant, and a re-review of the information found within Crocker and Fratantonio (2016), NMFS believes a transcription error occurred in the initial ITA application where the wrong operational parameters for the Applied Acoustics Dura-Spark 240 and the GeoMarine Geo-Source sparker units were incorrectly and inadvertently included. NMFS has added additional information and corrected existing information clarifying the use of the

GeoMarine Geo-Source sparker, the anticipated nominal operational characteristics of this source (*i.e.*, energy level and number of tips), the expected acoustic output (*i.e.*, dB_{rms}) based on these characteristics, and the Applied Acoustics Dura-Spark sparker unit. We have updated table 20 with this information and added footnotes to address these changes. Importantly, this update did not affect or change NMFS' overall final determinations for this rulemaking described in the proposed rule.

To provide additional clarity on the total allowed take from HRG surveys over the entire 5-year effective period of this final rulemaking, we added a column to table 21 labeled "Total 5-year Allowed Take By Level B Harassment".

Within the *Total Take Across All Activities* subsection of the Estimated Take section, NMFS updated the stock abundances for tables 22, 23, and 24 in this final rule based on the 2023 draft SAR estimates.

After review, NMFS noted that in table 25 of the proposed rule, the total take by Level B harassment, total take by Level A harassment, and total collective 5-year take for Atlantic spotted dolphins and Atlantic white-sided dolphins were inadvertently switched. Tables 24 and 26 of the proposed rule were unaffected. In this final rule, NMFS has addressed this to clearly display that total take by Level B harassment, total take by Level A harassment, and total 5-year take are correctly displayed for each species (see table 23 in this final rule). Where applicable, in the final rule, these updates have also been addressed in the Negligible Impact Analysis and Determination section and for the small numbers finding in the Small Numbers section.

The following changes are reflected in the Mitigation section of the preamble to this final rule:

We have updated our vessel separation distances in the *Vessel Strike Avoidance* section to align with the final Biological Opinion. A 500-m (1,640-ft) minimum separation distance is now required for all ESA-listed large whale species (*i.e.*, sperm whales, fin whales, sei whales) and any unidentified large whale species, and a 100-m (328-ft) minimum distance is required for all non-ESA-listed large whales (*i.e.*, humpback whales, minke whales). The North Atlantic right whale minimum separation distance (500 m (1,640 ft)) and the distance for all delphinid cetaceans and pinnipeds (50 m (164 ft)) did not change. We have also updated table 27 in the Mitigation section and the relevant language in the regulatory

text (see 50 CFR 217.304(b)(11) and (12)).

We have updated parts of the Mitigation section to include NMFS' website at: <https://www.fisheries.noaa.gov/national/ endangered-species-conservation/ reducing-vessel-strikes-north-atlantic-right-whales>, alongside the requirements to monitor Channel 16 and the Right Whale Sightings Advisory System. These updates have also been made in the relevant parts of the regulatory text (see 50 CFR 217.204(a)(3) and 217.204(b)(4)).

We have provided more information on what Project Company 1 would need to provide to NMFS Office of Protected Resources to fully allow for consideration of pile driving activities occurring in December. This includes details on a written request being provided by October 15th, as well as some information that must be included in this request, including but not limited to: (1) the installation schedule and types of piles to be installed; (2) the maximum number of piles that would be anticipated to be installed in December; (3) the planned hammer energies; and (4) any planned or additional mitigative measures that could be implemented to further reduce activities to North Atlantic right whales and other marine mammal species. These requirements have also been added to the Regulatory text at the end of the preamble, in 50 CFR 217.304(c)(1).

We have clarified the formatting and language within table 25 to allow for easier interpretation. However, none of the information that was originally in the proposed rule has changed in this table in the final.

In table 25, we have adjusted the language for the clearance and shutdown zones for North Atlantic right whales to be "any distance within the PAM Clearance/Shutdown zone", which is 10 km (6.21 mi).

Also in table 25, we have specified that the PAM system used by Project Company 1 must: (1) be able to detect all marine mammals; (2) maximize baleen whale detections; and (3) be capable of detecting North Atlantic right whales at 10 km (6.21 mi), with that understanding that other marine mammals (*e.g.*, harbor porpoise) may not be detected at 10 km (6.21 mi).

We have also provided additional clarification on when deliverables (*i.e.*, reports and plans) are provided to NMFS using "calendar" days versus actionable items (*i.e.*, December pile driving requests, PSO/PAM operator resume reviews) are provided to NMFS using "business" days. These were also

reflected, where appropriate, in the Monitoring and Reporting section, as well as the corresponding sections in the regulations at the end of this preamble.

In addition to the thorough SFV requirements in the proposed rule, and given abbreviated SFV requirements were inadvertently excluded from the proposed rule, we have added to this final rule the requirement that Project Company 1 must conduct abbreviated SFV monitoring (consisting of a single acoustic recorder placed at an appropriate distance from the pile) on all foundation installations for which the thorough SFV monitoring, as required in the proposed rule, is not carried out consistent with the Biological Opinion. NMFS requires that these SFV results must be included in the weekly reports. Any indications that distances to the identified Level A harassment and Level B harassment thresholds for whales must be addressed by Project Company 1, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles.

We have also updated and added requirements in the *Sound Field Verification (SFV)* subsection of the Monitoring and Reporting section to fully describe both thorough SFV and abbreviated SFV, in alignment with the final NMFS Greater Atlantic Regional Fisheries Office (GARFO) Biological Opinion.

We have added a requirement in the *Reporting* section for Project Company 1 to report operational sound levels from all installed piles, in alignment with a requirement found in the completed Biological Opinion.

We have removed specific dates, days of the week, and months from the *Reporting* section to provide additional flexibility for Project Company 1 and will include the relevant dates, days of the week, and months in the LOA.

Changes in the Regulatory Text

Within the regulatory text more broadly, we have made minor modifications and updates to some of the language to improve clarity and understanding.

Within 50 CFR 217.304 *Mitigation requirements*, several changes were made to paragraphs (c)(14)(vii), (viii), and (x) to both align with the completed Biological Opinion and to ensure flexibility and compliance in situations where SFV measurements indicate operational or NAS changes may be called for, or modified monitoring may be needed. These changes were informed by the comment letter

received from the Commission which primarily addressed concerns regarding SFV and noted that NMFS needed to better account for discrepancies between modeled and measured zones based on results from the interim SFV reports.

Under 50 CFR 217.304(c)(14)(viii), we have added a sub-condition specifying the action that Project Company 1 must undertake in the event all practicable measures that could reduce noise levels have been successfully implemented and exhausted but the results from the thorough SFV measurements continue to indicate that the distances to the marine mammal harassment thresholds are greater than those modeled assuming 10 dB attenuation. This includes a requirement to meet with NMFS within 3 business days to discuss the results of SFV monitoring, the severity of exceedance of distances to identified isopleths of concern, the species affected, modeling assumptions, and whether the SFV results demonstrate the magnitude and degree of impacts from the Project are greater than those considered in this final rule. This change was informed, in part, by the Commission's comment letter discussing concern with potential discrepancies between modeled and measured zones.

Within 50 CFR 217.304(c), several changes were made to paragraph (c)(14)(x) that provide updated information on thorough SFV, abbreviated SFV, and on what Project Company 1's Sound Field Verification Plan (SFV Plan) must include, to align these measures more closely with NMFS GARFO's final Biological Opinion.

Under 50 CFR 217.304(f), NMFS has better aligned and updated some of the mitigation measures for fishery monitoring surveys to better require training in marine mammal identification (50 CFR 217.304(f)(1)); better described actions if gear is being removed from the water when a marine mammal is sighted (50 CFR 217.304(f)(5)); described actions that must be undertaken during trawl surveys (50 CFR 217.304(f)(10)); provided a human safety caveat to the gear removal requirement (50 CFR 217.304(f)(15)); and, added reporting information to NMFS GARFO in the event gear is lost (50 CFR 217.304(f)(16)).

Within 50 CFR 217.305 *Monitoring and reporting requirements*, the regulatory text clarifies PSO and PAM operator qualification requirements. The number of PSOs required to monitor during offshore wind farm construction is extensive. To address concerns regarding the lack of very specific

experience contained within the proposed rule and increase the pool of qualified candidates, § 217.305(a)(7) has been updated to remove the requirement for specific experience working in the Northwest Atlantic Ocean. Instead, potential PSOs must demonstrate experience visually monitoring marine mammals, including baleen whales. This experience can be undertaken anywhere in the world. Upon closer consideration of this issue, NMFS finds that prior experience visually monitoring for marine mammals requires the same skill sets and is relevant and transferable to the monitoring required in the specified geographic region here.

Within 50 CFR 217.305(c), the requirement to employ 1 PAM operator per buoy stream has been removed, recognizing the PAM and data transfer systems vary widely and given NMFS' finding that fewer PAM operators may be sufficient to carry out PAM during pile driving. Instead, the final number of PAM operators will be identified in a NMFS-approved PAM Plan, in the context of what is sufficient given the specific system and circumstances.

Within 50 CFR 217.305(a), the PSO and PAM operator regulatory text has also been reorganized and removes the classification of PAM operators as conditional or unconditional, instead relying on the PAM operator experience described in the proposed rule to determine sufficiency of qualifications.

Within 50 CFR 217.305(c), the requirement to conduct and review PAM data for 24 hours prior to pile driving has been retained; however, the regulatory text in this final rule removes the term "immediately prior to foundation impact pile driving" when discussing reviewing 24-hours of PAM data before pile driving commenced, recognizing the logistical constraints this poses.

Within 50 CFR 217.305(g), the marine mammal visual and acoustic reporting requirements have also been updated to reflect regional and science center reporting mechanisms and standards.

Description of Marine Mammals in the Specific Geographic Region

As noted in the Changes From the Proposed to Final Rule section, updates have been made to the UME summaries of multiple species. These changes are described in detail in the sections below. We have also included new data on North Atlantic right whale abundance information and updated the annual M/SI value presented in table 2, based upon updates found in the draft 2023 SARs (see [\[marine-mammal-protection/marine-mammal-stock-assessment-reports\]\(https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports\)\). Otherwise, this section has not changed since the publication of the proposed rule in the **Federal Register** \(88 FR 65430, September 22, 2023\).](https://www.fisheries.noaa.gov/national/</p>
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Approximately 38 marine mammal species under NMFS' jurisdiction have geographic ranges within the western North Atlantic OCS (Hayes *et al.*, 2022), with several marine mammal species occurring within the specific geographic region for the Project (*i.e.*, Mid-Atlantic Bight). NMFS fully considered all of this information, and we refer the reader to these descriptions in the application instead of reprinting the information here. Sections 3 and 4 of Project Company 1's ITA application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species (Atlantic Shores, 2023). Additional information regarding population trends and threats may be found in NMFS' SARs at: <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 at: <https://www.fisheries.noaa.gov/find-species>.

Of the 38 marine mammal species and/or stocks with geographic ranges that include the Project Area (*i.e.*, found in the coastal and offshore waters of New Jersey), 22 are not expected to be present or are considered rare or unexpected in the Project Area based on sighting and distribution data (see table 11 in Project Company 1's ITA application). Therefore, they are not discussed further beyond the explanation provided here.

Furthermore, Project Company 1 did not request incidental take for these species, so they are not considered further in this ITA. Specifically, the following cetacean species are known to occur off of New Jersey but are not expected to occur in the Project Area due to the location of preferred habitat outside the Lease Areas and export cable route, based on the best available information: Blue whale (*Balaenoptera musculus*), Cuvier's beaked whale (*Ziphius cavirostris*), four species of Mesoplodont beaked whales (*Mesoplodon densirostris*, *Mesoplodon europaeus*, *Mesoplodon mirus*, and *Mesoplodon bidens*), clymene dolphin (*Stenella clymene*), false killer whale, Fraser's dolphin (*Lagenodelphis hosei*), killer whale (*Orcinus orca*), melon-headed whale, pantropical spotted dolphin (*Stenella attenuata*), pygmy killer whale

(*Feresa attenuata*), rough-toothed dolphin (*Steno bredanensis*), spinner dolphin (*Stenella longirostris*), striped dolphin (*Stenella coeruleoalba*), white-beaked dolphin (*Lagenorhynchus albirostris*), Northern bottlenose whale (*Hyperoodon ampullatus*), dwarf sperm whale (*Kogia sima*), and the pygmy sperm whale (*Kogia breviceps*). Two species of phocid pinnipeds are also uncommon in the Project Area, including: harp seals (*Pagophilus groenlandica*) and hooded seals (*Cystophora cristata*). In addition, the Florida manatees (*Trichechus manatus*; a sub-species of the West Indian manatee) has been previously documented as an occasional visitor to the Mid-Atlantic region during summer months (Morgan *et al.*, 2002; Cummings *et al.*, 2014). However, as manatees are managed solely under the jurisdiction of the U.S. Fish and Wildlife Service and

are considered rare or unexpected in the Project Area, they are not considered or discussed further in this document.

Table 2 lists all species or stocks for which take is anticipated and allowed under this final rule and summarizes information related to the species or stock, including regulatory status under the MMPA and ESA, and PBR, where known. PBR is defined 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 (16 U.S.C. 1362(20))). While no mortality is anticipated or allowed here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic and Gulf of Mexico SARs. Values presented in table 2 are the most recent available data at the time of publication which can be found in NMFS' 2023 draft SARs, available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>.

TABLE 2—MARINE MAMMAL SPECIES^a LIKELY TO OCCUR NEAR THE PROJECT AREA THAT MAY BE TAKEN BY PROJECT COMPANY 1'S ACTIVITIES

Common name	Scientific name	Stock	ESA/ MMPA status; strategic (Y/N) ^b	Stock abundance (CV, N _{min} , most recent abundance survey) ^c	PBR	Annual M/SI ^d
Order Artiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
<i>Family Balaenidae:</i>						
North Atlantic right whale ^e	<i>Eubalaena glacialis</i>	Western Atlantic	E, D, Y	340 (0, 337, 2021)	0.7	127.2
<i>Family Balaenopteridae (rorquals):</i>						
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic	E, D, Y	6,802 (0.24, 5,573, 2021)	11	2.05
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine	-, -, N	1,396 (0, 1,380, 2016)	22	12.15
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian Eastern Coastal	-, -, N	21,968 (0.31, 17,002, 2021).	170	9.4
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia	E, D, Y	6,292 (1.02, 3,098, 2021)	6.2	0.6
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
<i>Family Physeteridae:</i>						
Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic	E, D, Y	5,895 (0.29, 4,639, 2021)	9.28	0.2
<i>Family Delphinidae:</i>						
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic	-, -, N	31,506 (0.28, 25,042, 2021).	250	0
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic	-, -, N	93,233 (0.71, 54,443, 2021).	544	28
Bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic—Off-shore ^g .	-, -, N	64,587 (0.24, 52,801, 2021).	507	28
Common dolphin	<i>Delphinus delphis</i>	Northern Migratory Coastal	-, -, Y	6,639 (0.41, 4,759, 2016)	48	12.2–21.5
		Western North Atlantic	-, -, N	93,100 (0.56, 59,897, 2021).	1,452	414
Long-finned pilot whale ^h	<i>Globicephala melas</i>	Western North Atlantic	-, -, N	39,215 (0.30, 30,627, 2021).	306	5.7
Short-finned pilot whale ⁱ	<i>Globicephala macrorhynchus</i>	Western North Atlantic	-, -, Y	18,726 (0.33, 14,292, 2021).	143	218
Risso's dolphin	<i>Grampus griseus</i>	Western North Atlantic	-, -, N	44,067 (0.19, 30,662, 2021).	307	18
<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—Superfamily Pinnipedia						
<i>Family Phocidae (earless seals):</i>						
Gray seal ^l	<i>Halichoerus grypus</i>	Western North Atlantic	-, -, N	27,911 (0.20, 23,624, 2021).	1,512	4,570
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	-, -, N	61,336 (0.08, 57,637, 2018).	1,729	339

^a Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy at: <https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/> (Committee on Taxonomy (2023)).

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

^cNMFS' marine mammal stock assessment reports can be found online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>. CV is the coefficient of variation; N_{min} is the minimum estimate of stock abundance. In some cases, CV is not applicable.

^dThese 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.

^eThe current SAR includes an estimated population ($N_{best} = 340$) based on sighting history through December 2021 (see <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>). In October 2023, NMFS released a technical report identifying that the North Atlantic right whale population size based on sighting history through 2022 was 356 whales, with a 95 percent credible interval ranging from 346 to 363 (Linden, 2023).

^fIn the proposed rule (88 FR 65430, September 22, 2023), the best available science included a North Atlantic right whale M/SI value of 8.1 which accounted for detected mortality/serious injury. In the final 2022 SAR, released in June 2023, the total annual average observed North Atlantic right whale mortality was updated from 8.1 to 31.2. In the draft 2023 SAR, released on January 29, 2024 (89 FR 5495), the total annual average observed North Atlantic right whale mortality was updated from 31.2 to 27.2. Numbers presented in this table (27.2 total mortality (17.6 of which are attributed to fishery-induced mortality) are 2016–2020 estimated annual means, accounting for both detected and undetected mortality and serious injury (see <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>).

^gEstimates may include sightings of the coastal form.

^hKey uncertainties exist in the population size estimate for this species, including uncertain separation between short-finned and long-finned pilot whales, small negative bias due to lack of abundance estimate in the region between US and the Newfoundland/Labrador survey area, and uncertainty due to unknown precision and accuracy of the availability bias correction factor that was applied.

ⁱA key uncertainty exists in the population size estimate for this species based upon the assumption that the logistic regression model accurately represents the relative distribution of short-finned vs. long-finned pilot whales.

^jNMFS' stock abundance estimate (and associated PBR value) applies to the U.S. population only. Total stock abundance (including animals in Canada) is approximately 394,311. The annual M/SI value given is for the total stock.

North Atlantic Right Whale

In June 2023, NMFS released its final 2022 SARs, which updated the annual M/SI value for North Atlantic right whale from 8.1 to 31.2 due to the addition of estimated undetected mortality and serious injury, as described above, which had not been previously included in the SAR. The population estimate is slightly lower than the North Atlantic Right Whale Consortium's 2022 Report Card, which identifies the population estimate as 340 individuals (Pettis *et al.*, 2023). Elevated North Atlantic right whale mortalities have occurred since June 7, 2017 along the U.S. and Canadian coast, with the leading category for the cause of death for this UME determined to be "human interaction," specifically from entanglements or vessel strikes. Since publication of the proposed rule, the number of animals considered part of the UME has increased. As of August 26, 2024, there have been 40 confirmed mortalities (*i.e.*, dead, stranded, or floaters), 1 pending mortality, and 36 seriously injured free-swimming whales for a total of 77 whales considered to be part of the UME due to serious injury or mortality. As of October 14, 2022, the UME also considers animals ($n=65$) with sub-lethal injury or illness (*i.e.*, "morbidity"), bringing the total number of whales in the UME to 142. More information about the North Atlantic right whale UME is available online at: <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-north-atlantic-right-whale-unusual-mortality-event>.

Humpback Whale

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine to Florida. This event was declared a UME in April 2017. Partial or

full necropsy examinations have been conducted on approximately half of the 227 known cases (as of August 26, 2024), with 31 found within New Jersey's jurisdiction. Of the whales examined (approximately 90), about 40 percent had evidence of human interaction, either vessel strike or entanglement (refer to <https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2023-humpback-whale-unusual-mortality-event-along-atlantic-coast>). While a portion of the whales have shown evidence of pre-mortem vessel strike, this finding is not consistent across all whales examined and more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. More information is available at: <https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2023-humpback-whale-unusual-mortality-event-along-atlantic-coast>.

Since December 1, 2022, the number of humpback strandings along the mid-Atlantic coast, including New Jersey, has been elevated. In some cases, the cause of death is not yet known. In others, vessel strike has been deemed the cause of death. As the humpback whale population has grown, they are seen more often in the Mid-Atlantic. These whales may be following their prey (*i.e.*, small fish) which are reportedly close to shore in the winter. These prey also attract fish that are of interest to recreational and commercial fishermen. This increases the number of boats and fishing gear in these areas. More whales in the vicinity of areas traveled by boats of all sizes increases

the risk of vessel strikes. Vessel strikes and entanglement in fishing gear are the greatest human threats to large whales.

Minke Whale

Since January 2017, a UME has been declared based on elevated minke whale mortalities detected along the Atlantic coast from Maine through South Carolina. As of August 26, 2024, a total of 174 minke whales have stranded during this UME, with 14 of those located within New Jersey jurisdiction. Full or partial necropsy examinations were conducted on more than 60 percent of the whales. Preliminary findings have shown evidence of human interactions or infectious disease in several of the whales, but these findings are not consistent across all of the whales examined, so more research is needed. This UME has been declared non-active and is pending closure. More information is available at: <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-minke-whale-unusual-mortality-event-along-atlantic-coast>.

Phocid Seals

Since June 2022, elevated numbers of harbor seal and gray seal mortalities have occurred across the southern and central coast of Maine. This event was declared a UME in July 2022. Preliminary testing of samples has found some harbor and gray seals are positive for highly pathogenic avian influenza. While the UME is not occurring in the Project Area, the populations affected by the UME are the same as those potentially affected by the Project. However, due to the 2 states being approximately 352 km (219 mi) apart, by water (from the most northern point of New Jersey to the most southern point of Maine), NMFS does not expect that this UME would be further conflated by the activities

related to the Project. After a period of inactivity, this UME was closed on January 16, 2024 (see <https://www.fisheries.noaa.gov/feature-story/closure-2022-maine-pinniped-unusual-mortality-event#:~:text=NOAA%20Fisheries%20has%20declared%20the,Marine%20Mammal%20Unusual%20Mortality%20Events>). More information on this UME is available online at: <https://www.fisheries.noaa.gov/2022-2023-pinniped-unusual-mortality-event-along-maine-coast>. The above event was preceded by a different UME, occurring from 2018–2020 (closure of the 2018–2020 UME is pending). Beginning in July 2018, elevated numbers of harbor seal and gray seal mortalities occurred across Maine, New Hampshire, and Massachusetts. To date, stranded seals showing clinical signs have been found in Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Delaware, Maryland, and Virginia, although not in elevated numbers, therefore the UME investigation encompassed all seal strandings from Maine to Virginia. A total of 3,152 reported strandings (of both harbor seal and gray seal species) occurred from July 1, 2018, through March 13, 2020, with 101 occurring within the jurisdiction of New Jersey. Full or partial necropsy examinations have been conducted on some of the seals and samples have been collected for testing. Based on tests conducted thus far, the main pathogen found in the seals is phocine distemper virus. NMFS is performing additional testing to identify any other factors that may be involved in this UME. Information on this UME is available online at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2020-pinniped-unusual-mortality-event-along>.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (e.g., Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008; Southall *et al.*, 2019a). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing

ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in table 3.

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

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

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

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.*, 2006; Kastelein *et al.*, 2009; Reichmuth and Holt, 2013; Southall *et al.*, 2019a). For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

NMFS notes that in 2019a, Southall *et al.* recommended modified names for hearing groups that are widely recognized. However, this new hearing group classification does not change the

weighting functions or acoustic thresholds (i.e., the weighting functions and thresholds in Southall *et al.* (2019a) are identical to NMFS 2018 Revised Technical Guidance). When NMFS updates our Technical Guidance, we will be adopting the updated Southall *et al.* (2019a) hearing group classification.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from the Project's specified activities have the potential to result in the harassment of marine mammals in the specified geographic region. The proposed rule (88 FR 65430, September 22, 2023) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from Project Company 1's activities on marine mammals and their habitat. That information and analysis is not repeated here and readers should refer to the proposed rule.

However, since publication of the proposed rule, new scientific information has become available that provides additional insight into the sound fields produced by turbine operation. Although the proposed rulemaking (88 FR 65430, September 22, 2023) primarily covered the noise produced from construction activities relevant to the Project, operational noise was a consideration in NMFS' analysis of the Project, as all 200 turbines would become operational within the effective dates of the rule, beginning no sooner than 2026 and 2027 (it is expected that all turbines would be operational by 2028 and 2029). Once operational, offshore wind turbines are known to produce continuous, non-impulsive underwater noise, primarily below 1 kHz (Tougaard *et al.*, 2020; Stöber and Thomsen, 2021).

Project Company 1 has acknowledged that the WTG models may utilize either geared turbine designs or direct-drive turbine models, as both are currently available on the market. During the drafting of this final rulemaking, the applicant had not yet made a decision regarding the entire Atlantic Shores South Project, although they indicated that the Vestas turbine model planned for installation in Project 1 would use gearboxes. As there remains uncertainty regarding the model for Project 2, NMFS has included the following discussion on both gearboxes and direct-drive models to provide the public with all of the appropriate information NMFS considered in its analysis and during the drafting of this final rule.

Recently, direct-drive systems have been gaining popularity over older generation, geared (i.e., gearbox) turbine

designs. This growth has been largely attributed to their efficiency. Gearbox designs require the rotational speed of the turbine to be modulated by gears before reaching the generator, while direct-drive designs bypass this step and connect the rotor directly to the generator (van de Kaa *et al.*, 2020). The direct connection eliminates the need for a gearbox, one of the heaviest and most maintenance-intensive components of a turbine, and reduces gearbox failure and energetic losses as a result. Direct drive technology results in less wear in dynamic wind conditions, typically leads to slower rotational speeds, and has been shown to produce more energy on average (Bellmann *et al.*, 2023). Direct-drive technology also produces lower-frequency noise and is generally quieter than gearbox counterparts. It is possible that the slower rotational speeds and reduced mechanical components in direct-drive turbines impact the noise they produce (Tougaard *et al.*, 2020).

Tougaard *et al.* (2020) further stated that the operational noise produced by WTGs is static in nature and lower than noise produced by passing ships. This is a noise source in this region to which marine mammals are likely already habituated. Furthermore, operational noise levels are likely lower than those ambient levels already present in active shipping lanes, such that operational noise would likely only be detected in very close proximity to the WTG (Thomsen *et al.*, 2006; Tougaard *et al.*, 2020). Similarly, recent measurements from a wind farm (3 MW turbines) in China found at above 300 Hz, turbines produced sound that was similar to background levels (Zhang *et al.*, 2021). Other studies by Jansen and de Jong (2016) and Tougaard *et al.* (2009) determined that, while marine mammals would be able to detect operational noise from offshore wind farms (again, based on older 2 MW models) for several kilometers, they expected no significant impacts on individual survival, population viability, marine mammal distribution, or the behavior of the animals considered in their study (*i.e.*, harbor porpoises and harbor seals).

Recent scientific studies indicate that operational noise from turbines is on the order of 110 to 125 dB referenced to 1 micropascal (re 1 μ Pa) SPL_{rms} at an approximate distance of 50 m (164 ft) (Tougaard *et al.*, 2020; primarily from gearbox turbines). Recent measurements of operational sound generated from wind turbines (direct-drive, 6 MW, jacket foundations) at Block Island Wind Farm (BIWF) indicate average broadband levels of 119 dB at 50 m (164

ft) from the turbine, with levels varying with wind speed (HDR, 2019). Interestingly, measurements from BIWF turbines showed operational sound had less tonal components compared to European measurements of turbines with gearboxes.

More recently, Stöber and Thomsen (2021) used monitoring data and modeling to estimate noise generated by more recently developed, larger (10 MW) direct-drive WTGs. Their findings, similar to Tougaard *et al.* (2020), demonstrated that there is a trend that operational noise increases with turbine size. Their study predicts broadband source levels could exceed 170 dB SPL_{rms} for a 10 MW WTG; however, those noise levels were generated based on geared turbines; newer turbines typically operate with direct-drive technology. The shift from using gearboxes to direct-drive technology is expected to reduce the levels by 10 dB. The findings in the Stöber and Thomsen (2021) study have not been experimentally validated, though the modeling (using largely geared turbines) performed by Tougaard *et al.* (2020) yielded similar results for a hypothetical 10 MW WTG.

Furthermore, Holme *et al.* (2023) cautioned that Tougaard *et al.* (2020) and Stöber and Thomsen (2021) extrapolated levels for larger turbines should be interpreted with caution since both studies relied on data from smaller turbines (0.45 to 6.15 MW) collected over a variety of environmental conditions. They demonstrated that the model presented in Tougaard *et al.* (2020) tends to potentially overestimate levels (up to approximately 8 dB) measured to those in the field, especially with measurements closer to the turbine for larger turbines. Holme *et al.* (2023) measured operational noise from larger turbines (6.3 and 8.3 MW) associated with 3 wind farms in Europe and found no relationship between turbine activity (power production, which is proportional to the blade's revolutions per minute) and noise level, though it was noted that this missing relationship may have been masked by the area's relatively high ambient noise sound levels. Sound levels (RMS) of a 6.3 MW direct-drive turbine were measured to be 117.3 dB at a distance of 70 m (230 ft). However, measurements from 8.3 MW turbines were inconclusive as turbine noise was deemed to have been largely masked by ambient noise.

Bellmann *et al.* (2023) collected 27 operational noise measurements across 24 offshore wind farms consisting of 16 different WTG types of power ranging from 2.3 to 8 MW (approximately 70

percent of measurements from gearbox). It should be noted that the results from Holme *et al.* (2023) are based on a subset of these data. Similar to Holme *et al.* (2023), Bellmann *et al.* (2023) notes that no relationship between nominal WTG power and operational noise was observed, in contrast with the linear models used by Tougaard *et al.* (2020) and Stöber and Thomsen (2021). It is theorized that this is related to gearless and more modern WTGs measured as well as increased size and weight reducing transmission of vibrations. With regard to the extent of operational noise levels, Bellmann *et al.* (2023) concluded that tonal components of the operational noise are clearly observable at a range of 100 m (328 ft), but typically are not resolvable within the prevailing ambient noise at a range of 5 km (3.1 mi). However, Bellmann *et al.* (2023) also comment that these measurements were taken within the first year of operation, and that previous experience indicates noise levels will change significantly over time, likely due to wear and tear in gearbox WTGs, but that it is not clear at this time if these changes will also be present in direct-drive systems.

Finally, operational turbine measurements are available from the Coastal Virginia Offshore Wind (CVOW) pilot pile project, where two 7.8-m (25.6-ft) monopile WTGs were installed (BOEM, 2023). Compared to BIWF, levels at CVOW were higher (10–30 dB) below 120 Hz, believed to be caused by the vibrations associated with the monopile structure, while above 120 Hz levels were consistent among the 2 wind farms.

Globally, there are more than 341,000 operating WTGs (Global Wind Energy Council). Turbine failures are known to occur but are considered rare events (Katsaprakakis *et al.*, 2021, DOE, 2024a). For example, fewer than 40 incidents were identified in the modern fleet of more than 40,000 onshore turbines installed in the United States as of 2014 (DOE, 2024b). In 2022, the total global capacity of offshore wind reached 59,009 MW from 292 operating projects and over 11,900 operating wind turbines in 2022 (DOE, 2023), and a review of the relevant literature and media reports indicate blade failure among this cohort of turbines continues to be rare, consistent with industry performance in onshore wind turbines. On July 13, 2024, however, a blade on one of the WTGs at Vineyard Wind 1, a project located off of Martha's Vineyard and Nantucket, was damaged during the "warm up" phase of operations, causing a portion of the blade, primarily composed of fiberglass, to fall into the

water. In cooperation with Vineyard Wind 1, GE Vernova, the blade manufacturer, initiated debris recovery efforts and an investigation. Following this blade failure incident, the Bureau of Safety and Environmental Enforcement (BSEE), Department of Interior, issued a Suspension Order on July 17, 2024 (<https://www.bsee.gov/newsroom/latest-news/statements-and-releases/press-releases/bsee-statement-on-vineyard-wind>) and an additional Order for clarification on July 26, 2024 (<https://www.bsee.gov/newsroom/latest-news/statements-and-releases/press-releases/bsee-issues-new-order-to-vineyard-wind>), which suspends power production and any further wind turbine generator construction until the suspension is lifted.

As noted above, wind turbine failure is considered rare, and NMFS still considers the likelihood that blade failure would occur pursuant to Project Company 1's specified activity during the effective period of the ITA so low as to be discountable. Project Company 1 did not request, NMFS does not anticipate, and NMFS has not authorized, take of marine mammals incidental to a turbine blade failure and, therefore the topic is not discussed further.

Estimated Take

This section provides an estimate of the number of incidental takes allowed through this rulemaking, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Allowed takes would be primarily by Level B harassment, as use of the acoustic sources (*i.e.*, impact and vibratory pile driving and site characterization surveys) have the potential to result in disruption of marine mammal behavioral patterns due to exposure to elevated noise levels. Impacts such as masking and TTS can contribute to behavioral disturbances. There is also some potential for auditory injury (Level A harassment) to occur in select marine mammal species incidental to the specified activities (*i.e.*, WTG, OSS, and Met Tower foundation impact pile driving). For this action, this potential for PTS is limited to mysticetes, high-frequency cetaceans, and phocids due to their hearing sensitivities and the nature of the activities. The required mitigation and monitoring measures are expected to minimize the severity and magnitude of the taking to the extent practicable. As described previously, no serious injury

or mortality is anticipated or allowed for this Project. Below we describe how the take numbers were estimated.

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

Marine Mammal Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment). A summary of all NMFS' thresholds can be found at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Level B Harassment

Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source 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.*, other noises in the area, ambient noise), and the receiving animals (*e.g.*, hearing, motivation, experience, demography, behavior at time of exposure, life stage, depth) and can be difficult to predict (see, *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 metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on 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 the received root-mean-square sound pressure levels (RMS SPL) of 120 dB (referenced to 1 micropascal (re 1 μ Pa)) for continuous (*e.g.*, vibratory pile-driving, drilling) and above the received 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 as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

Project Company 1's construction activities include the use of continuous (*i.e.*, vibratory pile driving) and intermittent (*i.e.*, impact pile driving, HRG acoustic sources) sources, and therefore, the 120 and 160 dB re 1 μ Pa (rms) thresholds are applicable.

Level A Harassment

NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). As dual metrics, NMFS considers onset of PTS (Level A harassment) to have occurred when either one of the two metrics is exceeded (*i.e.*, metric resulting in the largest isopleth). Project Company 1's planned activities include the use of impulsive and non-impulsive sources.

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

TABLE 4—ONSET OF PERMANENT THRESHOLD SHIFT (PTS) (NMFS, 2018)

Hearing group	PTS onset thresholds* (received level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	Cell 1: $L_{p,0-pk,flat}$: 219 dB; $L_{E,p,LF,24h}$: 183 dB	Cell 2: $L_{E,p,LF,24h}$: 199 dB.
Mid-Frequency (MF) Cetaceans	Cell 3: $L_{p,0-pk,flat}$: 230 dB; $L_{E,p,MF,24h}$: 185 dB	Cell 4: $L_{E,p,MF,24h}$: 198 dB.
High-Frequency (HF) Cetaceans	Cell 5: $L_{p,0-pk,flat}$: 202 dB; $L_{E,p,HF,24h}$: 155 dB	Cell 4: $L_{E,p,HF,24h}$: 173 dB.
Phocid Pinnipeds (PW) (Underwater)	Cell 7: $L_{p,0-pk,flat}$: 218 dB; $L_{E,p,PW,24h}$: 185 dB	Cell 8: $L_{E,p,PW,24h}$: 201 dB.

* Dual metric thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds 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 Pa²s. In this table, thresholds are abbreviated to be more reflective of International Organization for Standardization (ISO) 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 160 kHz). The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW 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.

Project Company 1 would not conduct detonations of UXOs/MECs as part of the Project. As Project Company 1 has not requested, and NMFS has not allowed any take related to the detonation of UXOs/MECs, the acoustic (*i.e.*, PTS onset and TTS onset for underwater explosives) and the pressure thresholds (*i.e.*, lung and gastrointestinal tract injuries) are not discussed or included in this action.

Below we describe the assumptions and methodologies used to estimate take, in consideration of acoustic thresholds and appropriate marine mammals density and occurrence information, for WTG, OSS, and Met Tower foundation installation, temporary cofferdam installation, and HRG surveys. Resulting distances to thresholds, densities used, activity-specific exposure estimates (as relevant to the analysis), and activity-specific take estimates can be found in each activity subsection below. At the end of this section, we present the maximum amount of annual, 5-year total, and annual take that is reasonably expected to occur, and which NMFS has allowed.

Acoustic and Exposure Modeling

The predominant underwater noise associated with the construction of the Project results from impact and vibratory pile driving. Project Company 1 employed JASCO Applied Sciences (USA) Inc. (JASCO) to conduct acoustic modeling to better understand sound fields produced during these activities (Weirathmueller *et al.*, 2022). The basic modeling approach is to characterize the sounds produced by the source and determine how the sounds propagate within the surrounding water column. For impact pile driving, JASCO conducted sophisticated source and propagation modeling (as described

below). For vibratory pile driving activities, JASCO applied *in situ* data to estimate source levels and applied more simple propagation modeling. To assess the potential for take from impact pile driving, JASCO also conducted animal movement modeling to estimate exposures. JASCO estimated species-specific exposure probability by considering the range- and depth-dependent sound fields in relation to animal movement in simulated representative construction scenarios. To assess the potential for take from vibratory pile driving, exposure modeling was not conducted. Instead, a density-based estimation approach was used. More details on these acoustic source modeling, propagation modeling, and exposure modeling methods are described below.

JASCO’s Pile Driving Source Model (PDSM), a physical model of pile vibration and near-field sound radiation (MacGillivray, 2014), was used in conjunction with the GRL, Inc. Wave Equation Analysis of Pile Driving (GRLWEAP) 2010 wave equation model (Pile Dynamics, 2010) to predict representative source levels associated with impact pile driving activities (WTG, OSS, and Met Tower foundation installation). The PDSM physical model computes the underwater vibration and sound radiation of a pile by solving the theoretical equations of motion for axial and radial vibrations of a cylindrical shell. This model is used to estimate the energy distribution per frequency (source spectrum) at a close distance from the source (10 m (32.81 ft)). Piles are modeled as a vertical installation using a finite-difference structural model of pile vibration based on thin-shell theory. To model the sound emissions from the piles, the force of the pile driving hammers also had to be

modeled. The force at the top of each monopile and jacket foundation pile was computed using the GRLWEAP 2010 wave equation model, which includes a large database of simulated hammers. The forcing functions from GRLWEAP were used as inputs to the finite difference model to compute the resulting pile vibrations (see figures 8–10 in appendix B of Project Company 1’s ITA application for the computed forcing functions). The sound radiating from the pile itself was simulated using a vertical array of discrete point sources. These models account for several parameters that describe the operation (*i.e.*, pile type, material, size, and length) the pile driving equipment, and approximate pile penetration depth. The model assumed direct contact between the representative hammers, helmets, and piles (*i.e.*, no cushioning material). For both jacket and monopile foundation models, the piles are assumed to be vertical and driven to a penetration depth of 70 m (230 ft) and 60 m (197 ft), respectively.

Project Company 1 is required to employ noise abatement systems (NAS), also known as noise attenuation systems, during all foundation installation associated with permanent structures (*i.e.*, impact pile driving) to reduce the sound pressure levels that are transmitted through the water in an effort to reduce ranges to acoustic thresholds and minimize any acoustic impacts resulting from the activities. Project Company 1 is required to use at least a fully functional double big bubble curtain which may be combined with another NAS (*e.g.*, hydro-sound damper, or an AdBm Helmholtz resonator), as well as the adjustment of operational protocols to minimize noise levels. Other systems that could be implemented include an evacuated

sleeve system (e.g., IHC-Noise Mitigation System (NMS)), or encapsulated bubble systems (e.g., HydroSound Dampers (HSD)) to reduce sound levels. Hence, hypothetical broadband attenuation levels of 0 dB, 6 dB, 10 dB, and 15 dB were incorporated into the foundation source models to gauge effects on the ranges to thresholds given these levels of attenuation (appendix B of Project Company 1’s ITA application and associated supplemental documents). Although these 4 attenuation levels were evaluated, Project Company 1 and NMFS anticipate that the noise attenuation system ultimately chosen will be capable of reliably reducing source levels by 10 dB; therefore, this assumption was carried forward in this analysis for monopile and jacket foundation pile driving installation. See

the Mitigation section for more information regarding the justification for the 10-dB assumption.

In addition to considering noise abatement, the amount of sound generated during pile driving varies with the energy required to drive piles to a desired depth and depends on the sediment resistance encountered. Sediment types with greater resistance require hammers that deliver higher energy strikes and/or an increased number of strikes relative to installations in softer sediment. Maximum sound levels usually occur during the last stage of impact pile driving where the greatest resistance is encountered (Betke, 2008). Key modeling assumptions for the monopiles and pin piles are listed in table 5, with additional modeling details and input parameters can be found in

table B–1 in appendix B of Project Company 1’s ITA application. Hammer energy schedules for monopiles (both 12-m (39.37-ft) and 15-m (49.21-ft) diameters in size) and pin piles (5-m (16.4-ft) diameter) are provided in table 6, respectively. Decidcade spectral source levels for each pile type, hammer energy, and modeled location for summer sound speed profiles can be found in appendix B of Project Company 1’s ITA application (see figures 11 to 13 in the application). Due to a public comment received during the 30-day public comment period of the proposed rule, NMFS estimated the broadband SEL source levels from the decidcade spectra provided in the ITA application. The resulting SEL source levels for both the 12-m and 15-m monopiles at hammer energies of 4,400 kJ are approximately 227 dB.

TABLE 5—KEY PILING ASSUMPTIONS USED IN THE SOURCE MODELING

Foundation type	Maximum impact hammer energy (kJ)	Wall thickness (mm)	Pile length (m)	Seabed penetration depth (m)	Number per day
12-m Monopile Foundation	4,400	130	101	60	2
15-m Monopile Foundation	4,400	162	105	60	2
5-m Pin Pile for Jacket Foundation	2,500	72	76	70	4

TABLE 6—HAMMER ENERGY SCHEDULES FOR MONOPILES AND PIN PILES USED IN SOURCE MODELING

Modeled installation scenario	Hammer model	Energy level (kJ)	Strike count	Pile penetration range (m)	Strike rate (strikes/min)
12-m Monopile Foundation	Menck MHU 4400S	1,400	750	5	30
		1,800	1,250	5	
		2,000	4,650	15	
		3,000	4,200	15	
		4,400	1,500	5	
Total	12,350	45	30
15-m Monopile Foundation	Menck MHU 4400S	480	1,438	8	
		800	1,217	3	
		1,600	1,472	4	
		2,500	2,200	5	
		3,000	4,200	10	
4,000	2,880	9			
4,400	1,980	6			
Total	15,387	45	30
5-m Pin Piles for Jacket Foundation	IHC S–2500	1,200	700	10	
		1,400	2,200	20	
		1,800	2,100	15	
		2,500	1,750	10	
Total	6,750	55	

Within these assumptions, jacket foundations were assumed to be pre- and post-piled. Pre-piled means that the jacket structure is set on pre-installed piles while post-piling means that that jacket structure is placed on the seafloor

and the piles are subsequently driven through guides located at the base of each jacket leg. Due to these installation approaches, the jacket structure itself radiates sound, which needs to be accounted for in the modeling. Because

of this, JASCO estimated a larger broadband sound level for the piles (+2 dB) for the post-piling scenario.

After calculating source levels, Project Company 1 and JASCO used propagation models to estimate

distances to NMFS' harassment thresholds. The propagation of sound through the environment can be modeled by predicting the acoustic propagation loss—a measure, in decibels, of the decrease in sound level between a source and a receiver some distance away. Geometric spreading of acoustic waves is the predominant way by which propagation loss occurs. Propagation loss also happens when the sound is absorbed and scattered by the seawater, and absorbed, scattered, and reflected at the water surface and within the seabed. Propagation loss depends on the acoustic properties of the ocean and seabed and its value changes with frequency. Acoustic propagation modeling for impact pile driving applied JASCO's Marine Operations Noise Model (MONM) and Full Wave Range Dependent Acoustic Model (FWRAM) that combine the outputs of the source model with the spatial and temporal environmental context (*e.g.*, location, oceanographic conditions, and seabed type) to estimate sound fields. The lower frequency bands were modeled using JASCO's Marine Operations Noise Model Range-dependent Acoustic Model (MONM-RAM), which is based on the parabolic equation method of acoustic propagation modeling. For higher frequencies, additional losses resulting from absorption were added to the transmission loss model. See appendices B and D in Project Company 1's application and supplemental memoranda for more detailed descriptions of JASCO's propagation models.

Sounds produced by installation of the monopiles and pin piles were modeled at 2 sites determined to be representative for the entire Project (L01 and L02) for the 12-m (39.37-ft) and 15-m (49.21-ft) diameter monopile foundations. For the 5-m (16.4-ft) pin piles for jacket foundations, L01 in the southern section of the Lease Areas in 36.1 m (118.4 ft) of water depth was chosen and L02 in the northeastern section of the Lease Areas located in 28.1 m (92.2 ft) of water depth was chosen. Modeling locations are shown in figure 2 of appendix B in the ITA application. For temporary cofferdams, simpler propagation modeling using *in-situ* data was performed using information from Illingworth and Rodkin (2017), which measured the sound exposure level at 10 m (32.8 ft) distance from the pile for sheet piles using a vibratory hammer. JASCO used the source spectrum produced from this study (see figure 2 in appendix D, the revised cofferdam memo) to define the

expected source characteristics during Project Company 1's cofferdam installation and removal activities. JASCO's model, MONM, was again used to predict the SEL and SPL fields at representative locations near the proposed cofferdam locations, considering the influences of bathymetry, seabed properties, water sound speed, and water attenuation. Sheet piles were represented as a point source at a depth of 2 m (6.56 ft).

Due to seasonal changes in the water column, sound propagation is likely to differ at different times of the year. The speed of sound in seawater depends on the temperature ("T", measured in degree Celsius), salinity ("S", measured in parts per thousand (ppt)), and depth ("D", measured in m) and can be described using sound speed profiles. Oftentimes, a homogeneous or mixed layer of constant velocity is present in the first few meters. It corresponds to the mixing of surface water through surface agitation. There can also be other features, such as a surface channel, which corresponds to sound velocity increasing from the surface down. This channel is often due to a shallow isothermal layer appearing in winter conditions but can also be caused by water that is very cold at the surface. In a negative sound gradient, the sound speed decreases with depth, which results in sound refracting downwards which may result in increased bottom losses with distance from the source. In a positive sound gradient, as is predominantly present in the winter season, sound speed increases with depth and the sound is, therefore, refracted upwards, which can aid in long distance sound propagation. Within the Project Area from July through September, the average temperature of the upper 10 m to 15 m (32.81 ft to 49.21 ft) of the water column is higher, which resulted in an increased surface layer sound speed.

Acoustic propagation modeling for impact pile driving foundations was conducted using an average sound speed profile for a summer period (*i.e.*, May through November) given this would be when Project Company 1 would conduct the majority, if not all of its foundation installation work, and given that foundation pile driving occurring in December would be allowed at Federal Agency discretion and if it is necessary to complete the Project. Vibratory pile driving for cofferdams used a mean summer (*i.e.*, June through August) and mean winter (*i.e.*, December through February) for the acoustic propagation modeling, given the specifics described in the construction schedule. FWRAM

computes pressure waveforms via Fourier synthesis of the modeled acoustic transfer function in closely spaced frequency bands. Examples of decade spectral levels for each foundation pile type, hammer energy, and modeled location, using average summer sound speed profile are provided in Weirathmueller *et al.* (2022). Resulting distances to NMFS' harassment thresholds for impact driving of foundations and vibratory driving of cofferdams can be found in the *WTG, OSS, and Met Tower Foundation Installation and Cable Landfall Activities* subsections, respectively, below.

To estimate the probability of exposure of animals to sound above NMFS' harassment thresholds during impact pile driving for foundation installation, JASCO's Animal Simulation Model Including Noise Exposure (hereafter, "JASMINE") was used to integrate the sound fields generated from the source and propagation models described above with species-typical behavioral parameters (*e.g.*, dive patterns). Sound exposure models such as JASMINE use simulated animals (*i.e.*, animats) to sample the predicted three-dimensional ("3-D") sound fields with movement rules derived from animal observations. Animats that exceed NMFS' acoustic thresholds were identified and the range for the exceedances was determined. The output of the simulation yields the exposure history for each animat within the simulation. An individual animat's sound exposure levels were summed over a specific duration (*i.e.*, 24 hours), to determine its total received acoustic energy SEL and maximum received PK and SPL. These received levels are then compared to the threshold criteria within each analysis period.

JASCO ran JASMINE simulations for 7 days, assuming piling every day. Separate simulations were run for each scenario (*e.g.*, pile diameter/number of piles per day/season combination). The combined history of all animats gives a probability density function of exposure during the Project. The number of animals expected to exceed the regulatory thresholds per day is determined by scaling the number of predicted animat exposures by the species-specific density of animals in the area. The average number of exposures per day for the scenario in question was then multiplied by the number of days of pile driving planned for that scenario. In general, the number of days of pile driving is more influential in determining total exposures for Level B harassment than Level A harassment. However, the use

of other conservative parameters (*e.g.*, assuming most pile driving occurs in highest density months) in the calculation ensure that, regardless, the estimated take numbers appropriately represent the greatest number of instances that marine mammals are reasonably likely to be harassed by the activities.

By programming animats to behave like marine species that may be present near the Project Area, based on information obtained through scientific literature, the sound fields are sampled in a manner similar to that expected for real animals. The parameters used for forecasting realistic behaviors (*e.g.*, diving, foraging, and surface times) were determined and interpreted from marine species studies (*e.g.*, tagging studies) where available, or reasonably extrapolated from related species (Weirathmueller *et al.*, 2022).

For modeled animats that have received enough acoustic energy to exceed a given harassment threshold, the exposure range for each animal is defined as the closest point of approach (hereafter, "CPA") to the source made by that animal while it moved throughout the modeled sound field, accumulating received acoustic energy. The CPA for each of the species-specific animats during a simulation is recorded and then the CPA distance that accounts for 95 percent of the animats that exceed an acoustic impact threshold is determined. The $ER_{95\%}$ (95 percent exposure radial distance) is the horizontal distance that includes 95 percent of the CPAs of animats exceeding a given impact threshold. The $ER_{95\%}$ ranges are species-specific rather than categorized only by any functional hearing group, which allows for the incorporation of more species-specific biological parameters (*e.g.*, dive durations, swim speeds, *etc.*) for assessing the potential for PTS from impact pile driving.

Project Company 1 and JASCO also calculated acoustic ranges which represent the distance to harassment thresholds based on sound propagation through the environment independent of any receiver. As described above, applying animal movement and behavior within the modeled noise fields allows for a more realistic indication of the distances at which PTS acoustic thresholds are reached that considers the accumulation of sound over different durations. The use of acoustic ranges ($R_{95\%}$) to the Level A harassment SEL_{cum} metric thresholds to assess the potential for PTS is considered overly conservative as it does not account for animal movement and behavior and, therefore, assumes

that animals are essentially stationary at that distance for the entire duration of the pile installation, a scenario that does not reflect realistic animal behavior. The acoustic ranges to the SEL_{cum} Level A harassment thresholds for impact pile driving can be found in Project Company 1's ITA application but will not be discussed further in this analysis. However, because NMFS' Level A harassment (PTS dB_{peak}) and Level B harassment (SPL) thresholds refer to instantaneous exposures, acoustic ranges are more relevant to the analysis. Also, because animat modeling was not conducted for vibratory pile driving, acoustic range is used to assess Level A harassment (dB_{SEL}). Acoustic ranges to the Level A harassment (dB_{peak}) and Level B harassment threshold for each activity are provided in the *WTG, OSS, and Met Tower Foundation Installation* subsection below. The differences between exposure ranges and acoustic ranges for Level B harassment are minimal given it is an instantaneous method.

Density and Occurrence

In this section we provide the information about marine mammal density, presence, and group dynamics that informed the take calculations for all activities. For foundation installation and temporary cofferdam installation and removal, JASCO performed the analysis, while Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) assessed HRG surveys, on behalf of Project Company 1. In either case, the Duke University Marine Geospatial Ecology Laboratory Habitat-based Marine Mammal Density Models for the U.S. Atlantic (*i.e.*, the Duke University density models; Roberts *et al.*, 2016a; Roberts *et al.*, 2023) were applied to estimate take from foundation installation, temporary cofferdam installation and removal, and HRG surveys (please see each activity subsection below for the resulting densities). The models estimate absolute density (individuals/100 km²) by statistically correlating sightings reported on shipboard and aerial surveys with oceanographic conditions. For most marine mammal species, densities are provided on a monthly basis. Where monthly densities are not available (*e.g.*, pilot whales), annual densities are provided. Moreover, some species are represented as guilds (*e.g.*, seals (representing *phocidae spp.* comprising harbor and gray seals) and pilot whale *spp.* (representing short-finned and long-finned pilot whales)).

The Duke University density models delineate species' density into 5 x 5 km

(3.1 x 3.1 mi) grid cells. Project Company 1 calculated mean monthly densities for each species using grid cells within the Lease Areas and a predetermined buffer around the Lease Areas that represented the expected ensounded area to NMFS' harassment thresholds for each sound-producing activity. All 5 x 5 km (3.1 x 3.1 mi) grid cells in the models that fell partially or fully within the analysis polygon were considered in the calculations. Cells that fell entirely on land were not included, but cells that overlapped only partially with land were included.

For impact pile driving associated with foundation installation, the buffer from the edge of the Lease Areas was chosen as it was based on the largest 10 dB-attenuated (from the bubble curtain/NAS) exposure range calculated based on installation of a 15-m (49.21-ft) monopile using a 4,400 kJ hammer (3.9 km (2.4 mi); table 7). For vibratory pile driving associated with temporary cofferdam installation and removal, Project Company 1 applied the applicable buffer sizes at each of the landfall locations (7.546 km (4.7 mi) at the Atlantic City site and 11.286 km (7 mi) at the Monmouth site) based on the $R_{95\%}$ value for the largest acoustic range to threshold (table 8). For HRG surveys, Project Company 1 mapped the density data within the boundary of each survey area using geographic information systems (GIS). No buffer was applied given the small distance to Level B harassment (<200 m (<656.2 ft)) during surveys compared to the grid cell size in the Duke University density models (5 x 5 km (3.11 x 3.11 mi); table 9).

Here, NMFS notes that although the initial application submitted by Project Company 1 for their proposed rulemaking utilized Duke University's 2022 habitat-based marine mammal density models, as described further above and in the proposed rulemaking (88 FR 65430, September 22, 2023), in June 2022, during NMFS' review of the application materials, the new density models were released by Duke University (*i.e.*, Roberts *et al.*, 2016a; Roberts *et al.*, 2023), including for the North Atlantic right whale (Roberts *et al.*, 2024). After several months of review and evaluation, NMFS determined that the updated models represented the best available science and those were incorporated into the adequate and complete application materials and proposed rulemaking (88 FR 65430, September 22, 2023). Within this final rulemaking, as no new information has presented itself, NMFS maintains the use of these revised density models and has incorporated the necessary information herein.

TABLE 7—MEAN MONTHLY AND ANNUAL MARINE MAMMAL DENSITY ESTIMATES (ANIMALS/100 km²) FOR IMPACT PILE DRIVING CONSIDERING A 3.9-KM BUFFER AROUND THE LEASE AREAS^a

Marine mammal species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Annual Mean	May–Dec mean
North Atlantic right whale *	0.069	0.074	0.062	0.046	0.010	0.003	0.001	0.001	0.002	0.004	0.010	0.042	0.027	0.009
Fin whale *	0.178	0.123	0.098	0.099	0.088	0.075	0.047	0.028	0.029	0.031	0.038	0.141	0.081	0.060
Humpback whale	0.093	0.065	0.084	0.101	0.091	0.058	0.011	0.006	0.020	0.065	0.086	0.121	0.067	0.057
Minke whale	0.051	0.049	0.049	0.737	0.810	0.202	0.054	0.026	0.015	0.066	0.016	0.042	0.176	0.154
Sei whale *	0.026	0.016	0.034	0.074	0.027	0.006	0.001	0.001	0.002	0.008	0.026	0.042	0.022	0.014
Sperm whale *	0.004	0.002	0.001	0.007	0.010	0.005	0.003	0.000	0.000	0.000	0.003	0.004	0.003	0.003
Atlantic spotted dolphin	0.001	0.000	0.001	0.003	0.006	0.012	0.028	0.133	0.109	0.147	0.113	0.008	0.047	0.070
Atlantic white-sided dolphin	0.355	0.225	0.221	0.673	0.755	0.605	0.018	0.004	0.059	0.556	0.591	0.601	0.389	0.399
Bottlenose dolphin, off-shore ^d	1.409	0.489	0.732	2.460	6.311	8.449	9.350	9.485	8.613	8.335	9.468	5.944	5.920	8.244
Bottlenose dolphin, coastal ^d	2.917	1.024	2.053	8.290	20.869	27.429	29.272	31.415	32.096	29.744	30.414	16.667	19.349	27.238
Common dolphin	2.754	1.139	1.347	2.751	3.431	1.695	0.939	0.507	0.085	1.006	5.315	5.876	2.237	2.357
Long-finned pilot whale ^b													0.016	
Short-finned pilot whale ^b													0.012	
Risso's dolphin	0.015	0.002	0.003	0.031	0.029	0.008	0.006	0.006	0.006	0.013	0.074	0.115	0.026	0.032
Harbor porpoise	3.968	3.756	3.091	4.161	1.025	0.033	0.023	0.016	0.003	0.007	0.029	2.891	1.584	0.503
Gray seal ^c	4.881	3.521	2.352	2.866	4.508	0.492	0.080	0.054	0.120	0.639	1.731	4.588	2.153	1.527
Harbor seal ^c	10.967	7.911	5.285	6.439	10.127	1.106	0.180	0.122	0.271	1.437	3.889	10.308	4.837	3.430

Note: * denotes species listed under the Endangered Species Act.

^a Density estimates are calculated from the more recently released Duke Habitat-Based Marine Mammal Density Models (Roberts *et al.*, 2016a; Roberts *et al.*, 2023), including for the North Atlantic right whale (Roberts *et al.*, 2024).

^b Long- and short-finned pilot whale densities are the annual pilot whale guild density scaled by their relative abundances.

^c Gray and harbor seal densities are the seals guild density scaled by their relative abundances.

^d Bottlenose dolphin stocks were split based on the 3.9 km (2.42 mi) buffer at the 20-m (65.62-ft) isobath where the coastal stock was allocated to areas <20 m (<65.62 ft) and the offshore stock for areas >20 m (>65.62 ft).

TABLE 8—MAXIMUM MONTHLY DENSITIES^a (ANIMALS/100 km²) FOR SEPTEMBER THROUGH MAY USED TO ANALYZE COFFERDAM ACTIVITIES^b

Marine mammal species	Monmouth landfall site	Atlantic City landfall site
North Atlantic right whale *	0.035	0.092
Fin whale *	0.117	0.052
Humpback whale	0.132	0.114
Minke whale	0.526	0.136
Sei whale *	0.046	0.018
Sperm whale *	0.008	0.002
Atlantic spotted dolphin	0.033	0.014
Atlantic white-sided dolphin	0.206	0.051
Common dolphin	2.058	0.524
Bottlenose dolphin (offshore stock) ^c	22.53	0
Bottlenose dolphin (coastal stock) ^c	27.795	146.614
Long-finned pilot whale	0	0
Short-finned pilot whale	0	0
Risso's dolphin	0.02	0.002
Harbor porpoise	2.768	0.821
Gray seal	4.477	9.029
Harbor seal	10.059	20.287

Note: * denotes species listed under the Endangered Species Act.

^a Density estimates are calculated from the Duke Habitat-Based Marine Mammal Density Models (Roberts *et al.*, 2016a; Roberts *et al.*, 2023).

^b Density estimates are based on habitat-based density modeling of the entire Atlantic Exclusive Economic zone (EEZ).

^c For both bottlenose dolphin stocks, the impact area was split at the 20-m (65.62-ft) isobath where the coastal stock was assumed to be in <20 m (<65.62 ft) in depth and the offshore stock were allocated to waters >20 m (>65.62 ft) in depth.

TABLE 9—MAXIMUM SEASONAL DENSITIES USED TO ANALYZE THE ANNUAL HRG SURVEYS FOR THE PROJECT AREA^a

Marine mammal species	Stock	Maximum seasonal density (animals/100 km ²) ^b
North Atlantic right whale *	Western Atlantic	0.056
Fin whale *	Western North Atlantic	0.114
Humpback whale	Gulf of Maine	0.090
Minke whale	Canadian Eastern Coastal	0.401
Sei whale *	Nova Scotia	0.031
Sperm whale *	Western North Atlantic	0.005
Atlantic spotted dolphin	Western North Atlantic	0.033
Atlantic white-sided dolphin	Western North Atlantic	0.278
Bottlenose dolphin ^c	Northern Migratory Coastal	36.269
	Western North Atlantic—Offshore	

TABLE 9—MAXIMUM SEASONAL DENSITIES USED TO ANALYZE THE ANNUAL HRG SURVEYS FOR THE PROJECT AREA ^a—Continued

Marine mammal species	Stock	Maximum seasonal density (animals/100 km ²) ^b
Common dolphin	Western North Atlantic	1.473
Long-finned pilot whale ^d	Western North Atlantic	0.004
Short-finned pilot whale ^d	Western North Atlantic	0.003
Risso's dolphin	Western North Atlantic	0.017
Harbor porpoise	Gulf of Maine/Bay of Fundy	2.506
Gray seal ^e	Western North Atlantic	4.319
Harbor seal ^e	Western North Atlantic	9.704

Note: * denotes species listed under the Endangered Species Act.

^a The survey area accounts for waters within and around the Lease Areas and the export cable routes.

^b Density estimates are calculated from the Duke Habitat-Based Marine Mammal Density Models (Roberts *et al.*, 2016a; Roberts *et al.*, 2023), including for the North Atlantic right whale (Roberts *et al.*, 2024).

^c The bottlenose dolphin density is for the species collectively and was not delineated by stock.

^d Pilot whales are reported as a single “pilot whale” guild within the Duke University dataset (Roberts *et al.*, 2016a; Roberts *et al.*, 2023) and are not species-specific. To partition take between each of the long-finned and short-finned pilot whale species, the total density was scaled based on the abundance estimates provided in the NOAA Fisheries SARs.

^e Pinnipeds are reported as a single “seals” guild within the Duke University dataset (Roberts *et al.*, 2016a; Roberts *et al.*, 2023) and are not species-specific. To partition take between each of the harbor and gray seal species, the total density was scaled based on the abundance estimates provided in the NOAA Fisheries SARs.

Densities were computed based on when the planned activities were expected. For foundation installation, densities were accrued monthly, annually, and specifically for the May-December period that coincided with the planned pile driving activities. For temporary cofferdams, maximum monthly densities were calculated based on the planned September to May construction period. For HRG surveys, the maximum average seasonal density value for each marine mammal species was calculated.

Here we note some exceptions, based on the availability of data. For the pilot whale guild (*i.e.*, long-finned and short-finned), monthly densities are unavailable so annual mean densities were used instead. Additionally, the models provide density for pilot whales as a guild that includes both species. To obtain density estimates for long-finned and short-finned pilot whales, the guild density was scaled by the relative stock sizes based on the best available abundance estimate from NOAA Fisheries SARs (NOAA Fisheries, 2021b). Similarly, gray and harbor seal densities were scaled by each of their relative abundances, as found in the NOAA Fisheries SARs (NOAA Fisheries, 2021b). These scaled and surrogate densities were carried forward to the exposure and take estimates. Please see the activity-specific subsections below for resulting densities.

The equation below, using pilot whale *spp.* as an example, shows how abundance scaling is applied to compute densities for the pilot whale and seal guilds.

$$D_{short-finned} = D_{both} \times (N_{short-finned} / (N_{short-finned} + N_{long-finned}))$$

Where *D* represents density and *N* represents abundance.

For some species and activities, Atlantic Marine Assessment Program for Protected Species (AMAPPS) data from 2010–2019 shipboard distance sampling surveys (Palka *et al.*, 2021) and observational data collected during previous site assessment surveys in the Project Area indicate that the density-based exposure estimates may be insufficient to account for the number of individuals of a species that may be encountered during the planned activities. This is particularly true for uncommon or rare species with very low densities in the models. Hence, consideration of other data is required to ensure the potential for take is adequately assessed.

Here we note the existence of two different stocks of bottlenose dolphins, the coastal and offshore stocks, near the Project Area. However, the best available science consists of only a combined, single bottlenose dolphin density model found in Roberts *et al.* (2023). To appropriately account for which stock may be taken during foundation installation, the 3.9 km (2.42 mi) buffer was split at the 20-m (65.62-ft) isobath. Any bottlenose dolphins found within the 20-m (65.62-ft) isobath to shore were allocated to the coastal stock. Any that were outside of the 20-m (65.62-ft) isobath more seaward were allocated to the offshore stock. Animal simulations were run for each stock separately with the same behavioral characteristics. Because of this, the

exposure ranges are very similar between the two stocks as the only difference would be due to the different random seeding that was incorporated into the analysis. During cofferdam installation and removal, it was assumed that all dolphins near the Atlantic City landfall site would consist of the coastal stock, which allowed for a density value of zero for the offshore stock. However, given the Atlantic City landfall site did not exceed the 20-m (65.62-ft) isobath but the Monmouth site did, the area used to calculate the densities for bottlenose dolphins was split at the 20-m (65.62-ft) isobath. Because of this, any area <20 m (<65.62 ft) deep and >20 m (>65.62 ft) deep were used to calculate the exposures and takes for the coastal and offshore stocks, respectively. For HRG surveys, given that the northern migratory stock has more often been found in waters shallower than 20 m (65.62 ft), the survey area was divided along the 20-m (65.62-ft) isobath break. Project Company 1 estimated that 33 percent of the survey area fell from the 20-m (65.62-ft) isobath landward; therefore, 33 percent of the estimated take calculated for bottlenose dolphins was allocated to the coastal stock and the remaining was applied to the offshore stock.

Mean group sizes were used in the take estimation and were derived from NMFS’ data upload to the Ocean Biodiversity Information System (OBIS) repository (OBIS, 2022), which is informed by information from the AMAPPS 2010–2019 aerial and shipboard surveys, North Atlantic right whale aerial surveys, and other surveys.

The dataset was downloaded from OBIS and then filtered to include only observations from the Northwestern Atlantic region (extending from the Gulf of Maine to Cape Hatteras and the relevant shelf edge) with the institution owner code of “NMFS”. From there, the average group sizes were calculated as the mean value of the “individualCount” column for all sighting records for a species. Additional information was also incorporated based on Project Company 1’s experience with site characterization surveys in this region through issued IHAs (87 FR 24103, April 22, 2022; 88 FR 38821, June 14, 2023). This yielded unique group sizes for long-finned pilot whales, Atlantic spotted dolphins, and Risso’s dolphins that were used rather than the OBIS dataset.

Additional detail regarding the density and occurrence as well as the assumptions and methodology used to estimate take for specific activities is included in the activity-specific subsections below and in the February 2023 update memo. Average group sizes used in take estimates, where applicable, for all activities are provided in table 10.

TABLE 10—AVERAGE MARINE MAMMAL GROUP SIZES USED IN TAKE ESTIMATE CALCULATIONS

Marine mammal species	Mean group size
North Atlantic right whale * ...	c 3.8
Fin whale *	c 1.3
Humpback whale	c 1.8
Minke whale	c 1.1
Sei whale *	c 2.1
Sperm whale *	c 1.8
Atlantic spotted dolphin	a 100
Atlantic white-sided dolphin ..	c 21.4
Common dolphin	b 1.55
Bottlenose dolphin, coastal ..	c 13.1
Bottlenose dolphin, offshore	30
Long-finned pilot whale	a 20
Short-finned pilot whale	c 6.0
Risso’s dolphin	a 20

TABLE 10—AVERAGE MARINE MAMMAL GROUP SIZES USED IN TAKE ESTIMATE CALCULATIONS—Continued

Marine mammal species	Mean group size
Harbor porpoise	c 1.3
Gray seal	c 1.2
Harbor seal	c 1.2

Note: * denotes species listed under the Endangered Species Act.

^a These mean group sizes were used in the 2022 (87 FR 24103, April 22, 2022) and 2023 (88 FR 38821, June 14, 2023) IHAs for site characterization surveys and are informed by previous HRG surveys in the area.

^b The mean group size for common dolphins was based on the daily sighting rate of that species during HRG surveys.

^c These group sizes are from the OBIS data repository (OBIS, 2022).

WTG, OSS, and Met Tower Foundation Installation

Here we describe the results from the acoustic, exposure, and take estimate methodologies outlined above for WTG, OSS, and Met Tower foundation installation activity that have the potential to result in harassment of marine mammals (i.e., impact pile driving). We present exposure ranges to Level A harassment (SEL) thresholds from impact driving, acoustic ranges to Level A harassment (peak) and Level B harassment thresholds, densities, exposure estimates, and the amount of take requested and allowed incidental to foundation installation following the aforementioned assumptions (e.g., construction and hammer schedules).

As described above, this final rule analyzes a modified Schedule 2 which accommodates a full monopile WTG build-out of Project 1 and Met Tower and a full jacket buildout for the WTGs in Project 2. Schedule 2 assumes foundation installation activities would occur over a 2-year period (May through December, annually).

As previously described, JASCO integrated the results from acoustic

source and propagation modeling into an animal movement model to calculate exposure ranges for 16 marine mammal species (17 stocks) considered common in the Project Area. The resulting ranges represent the distances at which marine mammals may incur Level A harassment (i.e., PTS).

As described in the *Detailed Description of Specified Activities* section, Project Company 1’s preference is to install 15-m (49.21-ft) monopiles but Project Company 1 may alternatively install 12-m (39.37-ft) monopiles. Hence, we have provided the modeled exposure and ranges for 12-m (39.37-ft) and 15-m (49.21-ft) monopiles below. We note that because the 15-m monopiles produce larger sound fields, in general, in order to ensure a conservative analysis, this final rule assumes all take is consistent with that expected for the 15-m (49.21-ft) monopiles.

Similarly, as described in the *Detailed Description of Specified Activities* section, Project Company 1 may install pre- or post-piled pin piles to construct the jacket foundations. We note that because post-piled pin piles produce larger sound fields than pre-piled piles, this final rule carries forward take specific to the post-piled pin piles. To more appropriately account for the larger radiated area produced around the jacket foundations as pin piles are driven, the broadband sound level estimated for the jacket piles was increased by 2 dB in all post-piling scenarios. In either case, NMFS notes that soft-start of impact-driven piles was not quantitatively considered in the exposures and take estimates, as presented here.

Table 11 provides the exposure ranges for impact pile driving of a 12-m (39.37-ft) monopile, 15-m (49.21-ft) monopile, and 5-m (16.4-ft) pin pile and (pre- and post-piled) jacket foundations, assuming 10 dB of sound attenuation to the PTS (SEL) thresholds.

TABLE 11—EXPOSURE RANGES (ER_{95%}) IN KILOMETERS TO MARINE MAMMAL PTS (SEL; LEVEL A HARASSMENT) THRESHOLDS DURING IMPACT PILE DRIVING 12-m AND 15-m MONOPILES, AND 5-m PIN PILES (PRE- AND POST-PILED) FOR JACKETS, ASSUMING 10 dB ATTENUATION

Marine mammal species	12-m monopiles, 4,400 kJ hammer		15-m monopiles, 4,400 kJ hammer		5-m pin piles, 2,500 kJ hammer	
	One pile/day	Two piles/day	One pile/day	Two piles/day	Four pin piles/day (pre-piled)	Four pin piles/day (post-piled)
North Atlantic right whale (migrating) *	0.56	0.67	0.72	0.72	0.73	1.06
Fin whale (sei whale proxy) * ^a	1.09	1.30	1.81	1.83	1.80	1.90
Humpback whale	1.08	1.01	1.25	1.29	1.07	1.56
Minke whale	0.33	0.38	0.35	0.41	0.40	0.69
Sperm whale *	0	0	0	0	0	0
Atlantic spotted dolphin	0	0	0	0	0	0
Atlantic white-sided dolphin	0	0	0	0	0	0.01

TABLE 11—EXPOSURE RANGES (ER_{95%}) IN KILOMETERS TO MARINE MAMMAL PTS (SEL; LEVEL A HARASSMENT) THRESHOLDS DURING IMPACT PILE DRIVING 12-m AND 15-m MONOPILES, AND 5-m PIN PILES (PRE- AND POST-PILED) FOR JACKETS, ASSUMING 10 dB ATTENUATION—Continued

Marine mammal species	12-m monopiles, 4,400 kJ hammer		15-m monopiles, 4,400 kJ hammer		5-m pin piles, 2,500 kJ hammer	
	One pile/day	Two piles/day	One pile/day	Two piles/day	Four pin piles/day (pre-piled)	Four pin piles/day (post-piled)
Bottlenose dolphin (offshore)	0	0	0	0	0	0
Bottlenose dolphin (coastal)	0	0	0	0	0	0
Common dolphin	0	0	0	0	0	0
Long-finned pilot whale	0	0	0	0	0	0
Short-finned pilot whale	0	0	0	0	0	0
Risso's dolphin	0	0	0	0	<0.01	<0.01
Harbor porpoise	0.39	0.32	0.26	0.28	1.11	1.48
Gray seal	0.01	0	0.02	0	0.15	0.24
Harbor seal	<0.01	<0.01	<0.01	<0.01	0.16	0.32

Note: * denotes species listed under the Endangered Species Act.
^a Fin whales were used as a surrogate for sei whale behaviors.

We note here that between the two differently-sized monopiles, all of the distances to the Level A harassment threshold are smaller for the 12-m, with exception for the harbor porpoise distances, which show minute differences between the 15-m (0.26 and 0.28 km) and the 12-m (0.39 and 0.32 km) for each of one or two piles installed per day, respectively (table 11). This is because as the pile diameter increases from 12 to 15 m (39.37 to 49.21 ft), the frequency spectrum shifts and more of the energy increase occurs at the lower frequencies, which are largely filtered out by the high-frequency weighting function.

As described above, JASCO also calculated acoustic ranges which

represent distances to NMFS' harassment isopleths independent of movement of a receiver. Presented below are the distances to the PTS (dB peak) threshold for impact pile driving and the Level B harassment (SPL) thresholds for all impact pile driving during WTG, OSS, and Met Tower foundation installation (tables 12 and 13).

NMFS acknowledges an error in the proposed rule, in which the acoustic ranges to the Level B harassment thresholds were incorrectly identified due to a labeling mistake by JASCO in appendix B. Here, in table 13, we correct that by showing the values from the proposed rule, as well as the corrected values used in this final rule.

The values found in the JASCO documents did not assume 10 dB of sound attenuation, which is why we have instead provided the flat acoustic range (flat R_{95%}) values at 170 dB from the ITA Application materials (*i.e.*, 10 dB of attenuation from the 160-dB behavioral harassment threshold). All of these values can be found in appendix B of Project Company 1's application materials, located on NMFS' website at: https://media.fisheries.noaa.gov/2022-09/AtlanticShoresOWF_2022_Appendix%20B_OPR1.pdf. The previous values, now updated, did not impact our analysis and determinations regarding take, as those values were merely a data copying error of acoustic ranges.

TABLE 12—ACOUSTIC RANGES ($R_{95\%}$), IN KILOMETERS, TO PTS (L_{pk}) THRESHOLDS DURING IMPACT PILE DRIVING, ASSUMING 10 dB ATTENUATION

Pile type	Installation method	Modeled source location	Hammer energy (kJ)	Activity duration (minutes)	Phocids		
					Low-frequency cetacean 219 $L_{p, pk}$	Mid-frequency cetacean 230 $L_{p, pk}$	High-frequency cetaceans 202 $L_{p, pk}$
12-m Monopile	Impact hammer	L01	4,400	540	0.08	0.01	0.72
		L02	4,400	540	0.06	0.01	0.74
15-m Monopile	Impact hammer	L01	4,400	540	0.08	0.01	0.78
		L02	4,400	180	0.07	0.01	0.78
5-m Pin Pile	Impact hammer	L01	2,500	180	0.02	0.00	0.28
		L02	2,500	180	0.02	0.00	0.28
5-m Pin Pile (2 dB shift for post-piled)	Impact hammer	L01	2,500	180	0.01	0.00	0.23
		L02	2,500	180	0.01	0.01	0.14

Note: $L_{p, pk}$ = peak sound pressure (dB re 1 μ Pa).

TABLE 13—FLAT ACOUSTIC RANGES (FLAT $R_{95\%}$), IN KILOMETERS, TO LEVEL B HARASSMENT (SPL, 170 L_p) THRESHOLD DURING IMPACT PILE DRIVING, NOT ASSUMING 10 dB ATTENUATION

Pile type	Installation method	Hammer energy (kJ)	Indicated in proposed rulemaking (R_{max})		Indicated in final rulemaking (flat $R_{95\%}$)	
			L01	L02	L01	L02
12-m Monopile	Impact Hammer ...	4,400	8.20	7.31	^a 4.26	^b 3.91
15-m Monopile	Impact Hammer ...	4,400	8.30	7.44	^c 4.31	^d 4.00
5-m Pin Pile (pre-piled)	Impact Hammer ...	2,500	4.76	1.98	^e 2.47	^f 0.63
5-m Pin Pile (post-piled)	Impact Hammer ...	2,500	5.50	2.28	^g 2.81	^h 0.81

Note: L_p = root-mean square sound pressure (dB re 1 μ Pa).
^a Table F–45 in appendix B in Project Company 1’s application.
^b Table F–65 in appendix B in Project Company 1’s application.
^c Table F–52 in appendix B in Project Company 1’s application.
^d Table F–72 in appendix B in Project Company 1’s application.
^e Table F–59 in appendix B in Project Company 1’s application.
^f Table F–79 in appendix B in Project Company 1’s application.
^g Table F–60 in appendix B in Project Company 1’s application.
^h Table F–80 in appendix B in Project Company 1’s application.

Next, the specific densities for each marine mammal species were incorporated. Initially, Project Company 1 provided the densities used in the analysis in their ITA application. However, due to the June 2022 release of the updated Duke University density models, Project Company 1 submitted a memo with the revised densities and the derived exposure and take estimates. These were the values NMFS carried forward into this final rule (refer back to table 7).

To estimate take from foundation installation activities, Project Company 1 assumed the buildout described for the modified Schedule 2 (see the Project Design Envelope (PDE) Refinement Memorandum), which entails that all WTGs and the Met Tower found within

Project 1 would be built using 15-m (49.21-ft) monopiles and all WTGs in Project 2 would be built on jacket foundations using 5-m (16.4-ft) piles. All OSSs would be built on jacket foundations using 5-m (16.4-ft) pin piles. The full buildout of Atlantic Shores South ($n=200$ WTGs) assuming Schedule 2 is provided on table 6. This represents the take that is reasonably expected to occur incidentally to Atlantic Shores South as no more than 200 WTGs, 1 Met Tower, and 10 OSSs will be installed within the Lease Areas. Given uncertainty at the final stage about the specific buildout of Projects 1 and 2, there is a need to also estimate the total amount of annually allowed take from both Projects 1 and 2 which, collectively, is conservatively greater

given it is currently unknown exactly how many WTG and OSSs will be constructed in each. For this analysis, it was assumed that Project 1 may have a maximum of 105 WTGs (plus 6 WTG foundations installed as part of the Overlap Area for Project 1; $n=111$), 1 Met Tower, and 2 OSSs and Project 2 may have a maximum of 89 WTGs (plus 6 WTG foundations installed as part of the Overlap Area for Project 2; $n=95$) and 2 OSS. As described above, the number of days of pile driving per month is part of the exposure estimate calculation. Project Company 1 assumes that 1 monopile could be installed per day and 4 pin piles could be installed per day.

TABLE 14—PROJECT 1 AND PROJECT 2's BUILDOUT SCHEDULE PRESENTED ANNUALLY AND OVER TWO-YEARS

Construction month	Year 1 (2026)				Year 2 (2027) ^a				
	Project 1		Project 2		Total				
	Number of days (number of piles installed)		Number of days (number of piles installed)		Number of days (number of piles installed)				
	WTG and Met Tower monopile 15-m (1 pile/day)	OSS jacket 5-m pin piles (4 piles/day)	WTG jacket 5-m pin piles (4 piles/day)	OSS jacket 5-m pin piles (4 piles/day)	WTG and Met Tower monopile 15-m (1 pile/day)	WTG jacket 5-m pin piles (4 piles/day)	OSS jacket 5-m pin piles (4 piles/day)	WTG jacket 5-m pin piles (4 piles/day)	OSS jacket 5-m pin piles (4 piles/day)
May	8 (8)	0 (0)	0 (0)	0 (0)	8 (8)	0 (0)	0 (0)	5 (20)	0 (0)
June	20 (20)	6 (24)	0 (0)	0 (0)	20 (20)	0 (0)	0 (0)	15 (60)	6 (24)
July	25 (25)	0 (0)	0 (0)	0 (0)	25 (25)	0 (0)	0 (0)	20 (80)	0 (0)
August	19 (19)	6 (24)	0 (0)	0 (0)	19 (19)	0 (0)	0 (0)	18 (72)	6 (24)
September	18 (18)	0 (0)	0 (0)	0 (0)	18 (18)	0 (0)	0 (0)	14 (56)	0 (0)
October	16 (16)	0 (0)	0 (0)	0 (0)	16 (16)	0 (0)	0 (0)	13 (52)	0 (0)
November	5 (5)	0 (0)	5 (20)	0 (0)	5 (5)	5 (20)	0 (0)	4 (16)	0 (0)
December	1 (1)	0 (0)	1 (4)	0 (0)	1 (1)	1 (4)	0 (0)	0 (0)	0 (0)
Totals									
Total Piling Days	112	12	6	6	112	18	101	101	101
Total Piles	112	48	24	24	112	72	404	404	404
Total Foundations ^b	112	2	6	6	112	8	91	91	91

^a As 2027 only has foundation installation activities occurring from Project 2, there is no total column for this year.

^b The total WTG and Met Tower foundations (n=207) included in this table sum up to more than the planned number of WTG and Met Tower foundations (n=201) due to the possibility of 6 WTGs being installed either under Project 1 or Project 2 in the Overlap Area; these are therefore counted twice within this table but only counted once within the take analysis.

Project Company 1 assumes that construction would start in 2026 for foundation installation (refer back to table 1). Modeling assumed that up to 106 monopile foundations (105 WTGs plus the Met Tower) would be installed during May through October in the area for Project 1 (2026) and up to 89 monopiles (WTGs) for Project 2 for May through December (in part of 2026 and in 2027). Additionally, up to 6 monopile foundations (WTGs) could be installed during November through December for either Project 1 or Project 2 (total of 112 WTG and Met Tower foundations for Project 1 or a total of 94 WTG foundations for Project 2). This analysis also assumes the buildout of two large-sized OSSs for each Project 1 and Project 2 would be installed on multi-legged jacket foundations during June and August. Project Company 1 expects that all foundation installation activities for Project 1 would occur during the first year of construction activities

(2026) with parts of Project 2 starting in 2026 and completing in 2027.

Between these schedules, we note that Project Company 1 has analyzed and NMFS has carried over for the construction of 205 permanent foundation structures, including up to 200 WTGs, one Met Tower, and 4 large-sized OSSs. The Project 1 take calculations include the 6 WTGs in the Overlap Area during Year 1 to ensure sufficient take for Project 1 (if those positions are allocated to Project 1 during construction). If, however, those positions are allocated to Project 2, they are also included during Year 1 of foundation installation for Project 2 (to ensure sufficient take allocation to Project 2 during that year). However, the full buildout scenario, which describes the take for the Projects combined, only includes the 6 WTGs in the entire Project once (to avoid double counting of the 6 WTGs).

As described previously, to estimate the amount of take that may occur

incidental to the foundation installation, Project Company 1 conducted exposure modeling to estimate the number of exposures that may occur from impact pile driving in a 24-hour period. Exposure estimates were then scaled to reflect the appropriate density estimates as described above. These scaled 24-hour exposure estimates were then multiplied by the number of days to produce the estimated take numbers for each year. Exposure estimates can be found within the LOA Updates Memo on NMFS' website.

As described above, exposure estimates were subsequently adjusted based on appropriate group sizes and PSO data (refer back to table 10) to yield the requested take in Project Company 1's LOA Updates Memo. The amount of take Project Company 1 requested similarly equates to the amount of take NMFS has allowed in this final rule (tables 15 and 16).

TABLE 15—ANNUAL TOTAL EXPOSURE ESTIMATES AND ALLOWABLE TAKES BY LEVEL A HARASSMENT AND LEVEL B HARASSMENT FOR FOUNDATION INSTALLATION ACTIVITIES FOR PROJECT 1, ASSUMING SCHEDULE 2^a

Marine mammal species	Year 1 (2026)				Year 2 (2027) ^b			
	Estimated exposures		Allowed takes		Estimated exposures		Allowed takes	
	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
North Atlantic right whale *	0.14	1.24	0	4	0	0	0	0
Fin whale *	2.80	8.23	3	9	0	0	0	0
Humpback whale	2.20	8.33	3	9	0	0	0	0
Minke whale	10.07	135.38	11	136	0	0	0	0
Sei whale *	0.35	1.04	1	3	0	0	0	0
Sperm whale *	0	0	0	2	0	0	0	0
Atlantic spotted dolphin	0	0	0	100	0	0	0	0
Atlantic white-sided dolphin	0.01	159.94	1	160	0	0	0	0
Bottlenose dolphin—offshore	0	3,100.73	0	3,101	0	0	0	0
Bottlenose dolphin—coastal	0	50.32	0	51	0	0	0	0
Common dolphin	0	0	0	193	0	0	0	0
Long-finned pilot whale	0	0	0	20	0	0	0	0
Short-finned pilot whale	0	0	0	6	0	0	0	0
Risso's dolphin	<0.01	5.58	1	30	0	0	0	0
Harbor porpoise	1.38	49.85	2	50	0	0	0	0
Gray seal	0.52	98.42	1	99	0	0	0	0
Harbor seal	1.29	235.51	2	236	0	0	0	0

Note: * denotes species listed under the Endangered Species Act.

^a While the foundation installation counted the 6 WTGs in the Overlap Area for both Project 1 and Project 2, the exposure estimates and take requested is based on those 6 WTGs only being installed once under the full buildout scenario; no double counting of take occurred.

^b All of Project 1's activities would be completed within a single year (2026), which means that no take would occur during the second construction year (2027).

TABLE 16—ANNUAL TOTAL EXPOSURE ESTIMATES AND ALLOWABLE TAKES BY LEVEL A HARASSMENT AND LEVEL B HARASSMENT FOR FOUNDATION INSTALLATION ACTIVITIES FOR PROJECT 2, ASSUMING SCHEDULE 2

Marine mammal species	ITA Request Year (2026)				ITA Request Year (2027)			
	Estimated exposures		Allowed takes		Estimated exposures		Allowed takes	
	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
North Atlantic right whale *	0.08	0.43	0	4	0.24	1.31	0	4
Fin whale *	0.24	0.65	1	2	3.46	9.20	4	10
Humpback whale	0.46	1.53	1	2	3.02	9.82	4	10
Minke whale	0.16	1.55	1	2	16.27	141.72	17	142
Sei whale *	0.13	0.34	1	3	0.41	1.09	1	3
Sperm whale *	0	0	0	2	0	0	0	2
Atlantic spotted dolphin	0	0	0	100	0	0	0	100
Atlantic white-sided dolphin	0	21.98	0	22	0.01	171.37	1	172
Bottlenose dolphin—offshore	0	201.39	0	202	0	3,416.59	0	3,417
Bottlenose dolphin—coastal	0	0	0	14	0	0	0	14
Common dolphin	0	0	0	10	0	0	0	157
Long-finned pilot whale	0	0	0	20	0	0	0	20
Short-finned pilot whale	0	0	0	6	0	0	0	6
Risso's dolphin	<0.01	2.61	1	30	<0.01	6.03	1	30
Harbor porpoise	5.40	17.14	6	18	12.52	39.23	13	40
Gray seal	0.45	23.56	1	24	2.00	94.34	2	95
Harbor seal	1.66	53.29	2	54	7.03	213.40	8	214

Note: * denotes species listed under the Endangered Species Act.

Based on tables 15 and 16 above, NMFS allows the following numbers for the harassment of marine mammals incidental to foundation installation activities of WTGs, OSSs, and the Met Tower by Level A harassment and Level B harassment in table 17. We note that some of the values presented here will be different than those found in the proposed rule (88 FR 65430, September 22, 2023) as NMFS has since

acknowledged that takes from Project 2 were not appropriately added to the takes from Project 1 in Year 2 (when a limited number of WTG foundations from Project 2 may occur in the same year as Project 1). The numbers as presented in this final rulemaking correct these values and are a more appropriate metric to assess the entire buildout of both Projects associated with the full scope of Atlantic Shores

South. We further acknowledge that Project Company 1 did not request, nor is NMFS authorizing, take by the serious injury and/or mortality of marine mammals. Furthermore, no Level A harassment of North Atlantic right whales has been allowed due to enhanced mitigation measures that Project Company 1 is required to implement for this species.

TABLE 17—SUMMED^a ANNUAL EXPOSURE ESTIMATES AND ALLOWABLE TAKES BY LEVEL A HARASSMENT AND LEVEL B HARASSMENT FOR ALL FOUNDATION INSTALLATION ACTIVITIES IN BOTH PROJECT 1 AND PROJECT 2 (FULL BUILDOUT), ASSUMING SCHEDULE 2^b

Marine mammal species	ITA request year (2026)				ITA request year (2027)			
	Estimated exposures		Allowed takes		Estimated exposures		Allowed takes	
	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
North Atlantic right whale *	0.22	1.67	0	8	0.24	1.41	0	4
Fin whale *	3.04	8.88	4	11	3.46	9.2	4	10
Humpback whale	2.66	9.86	4	11	3.02	9.82	4	10
Minke whale	10.23	136.93	12	138	16.27	141.72	17	142
Sei whale *	0.48	1.38	2	6	0.41	1.09	1	3
Sperm whale *	0	0	0	4	0	0	0	2
Atlantic spotted dolphin	0	0	0	200	0	0	0	100
Atlantic white-sided dolphin	0.01	181.92	1	182	0.01	171.37	1	172
Bottlenose dolphin—offshore	0	3,302.12	0	3,303	0	3,416.59	0	3,417
Bottlenose dolphin—coastal	0	50.32	0	65	0	0	0	14
Common dolphin	0	0	0	203	0	0	0	157
Long-finned pilot whale	0	0	0	40	0	0	0	20
Short-finned pilot whale	0	0	0	12	0	0	0	6
Risso's dolphin	<0.02	8.19	2	60	<0.01	6.03	1	30
Harbor porpoise	6.78	66.99	8	68	12.52	39.34	13	40
Gray seal	0.97	121.98	2	123	2	94.34	2	95
Harbor seal	2.95	288.8	4	290	7.03	213.4	8	214

Note: * denotes species listed under the Endangered Species Act.

^aThe values NMFS in this final rule are different from those originally proposed for most species, as NMFS recognized the table in the proposed rule inadvertently omitted the Project 2 takes in 2026 (as identified in table 18 of the proposed rule).

^bWhile the foundation installation counted the 6 WTGs in the Overlap Area for both Project 1 and Project 2, the exposure estimates and take requested is based on those 6 WTGs only being installed once under the full buildout scenario; no double counting of take occurred. In total, this table accounts for estimated exposure and allowable take estimates for the total build-out of 200 WTGs, 1 Met Tower, and 4 OSSs (large size).

^cFor Risso's dolphins, the individual exposure estimates for Level A harassment for the first year of foundation installation (2026) were each less than 0.01 for each Project 1 and Project 2. In summing these two Projects together to yield the total exposure estimates for foundation pile driving, the total is 0.02, although this is likely a conservative overestimate, given the initial values were less than 0.01 apiece.

Cable Landfall Activities

We previously described the acoustic modeling and static methodologies to estimate the take of marine mammals and have already identified that Project Company 1 estimated take using propagation modeling and a static density-based approach. This information will not be reiterated here. Here, we present the results of acoustic modeling and take estimation processes, as previously described. More

information can also be found in the ITA application and subsequent supplementary memos provided by the applicant.

Project Company 1 plans to install and remove up to four temporary cofferdams per Atlantic and Monmouth cable landfall location (eight cofferdams total) using a vibratory hammer. To calculate the acoustic ranges to PTS thresholds, it was assumed that up to 8 hours of vibratory pile driving would

occur within any 24-hour period. The furthest ranges were noted where the sound propagated offshore from the New Jersey coastline into the continental shelf (see figure 3 in the supplemental memo for appendix D). Variation in acoustic ranges between the two sites is due to differing propagation loss properties. See table 18 below for the ranges to the thresholds for both Level A harassment and Level B harassment.

TABLE 18—ACOUSTIC RANGES ($R_{95\%}$) IN METERS TO THE LEVEL A HARASSMENT (PTS) AND LEVEL B HARASSMENT THRESHOLDS FROM VIBRATORY PILE DRIVING DURING TEMPORARY COFFERDAM INSTALLATION AND REMOVAL

Marine mammal hearing group	Atlantic City landfill site				Monmouth landfill site			
	Level A harassment SEL_{cum} thresholds (dB re 1 $\mu Pa^2 \cdot s$)		Level B harassment SPL_{rms} threshold (120 dB re 1 μPa)		Level A harassment SEL_{cum} thresholds (dB re 1 $\mu Pa^2 \cdot s$)		Level B harassment SPL_{rms} threshold (120 dB re 1 μPa)	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
Low-frequency cetaceans	65	65	5,076	7,546	45	60	5,412	11,268
Mid-frequency cetaceans	0	0			0	0		
High-frequency cetaceans	490	540			425	450		
Phocid Pinnipeds	30	30			20	20		

Given the very small distances to the Level A harassment thresholds (0 to 540 m (0 to 1,771.65 ft)), which accounts for 8 hours of vibratory pile driving, installation and removal of temporary cofferdams is not expected to result in any Level A harassment of marine mammals. Project Company 1 did not request, nor has NMFS allowed any Level A harassment incidental to vibratory pile driving activities for nearshore cable landfall activities.

Using the acoustic ranges to the Level B harassment threshold, the ensonified area around each cable landfall construction site was determined for each of the two seasons (*i.e.*, summer and winter) using the following formula: $Ensonified\ Area = \pi \times r^2$,

where *r* is the linear acoustic range distance from the source to the isopleth to the Level B harassment thresholds. Given the acoustic source is stationary, this formula assumes the distance to threshold would be the radius with the source in the center.

For vibratory pile driving associated with the sheet pile installation and removal necessary for cofferdams, it was assumed that the daily ensonified area was 104.33 km² (25,780.12 acres) at the Atlantic City landfall site and 221.77 km² (54,799.57 acres) at the Monmouth landfall site. To estimate marine mammal densities around the nearshore landfall sites, the largest 95th percentile acoustic range to threshold (R_{95%}; 7.546 km (24,757 ft) at the Atlantic City site and 11.268 km (36,968 ft) at the

Monmouth site) were used as density buffers. The maximum annual densities were calculated for each landfall location based on the average of the Duke University density model grid cells for each species and the period of time for when cofferdam activities may occur (*i.e.*, September through May). Any grids that overlapped partially or completely were included. Grid cells that fell entirely on land were not included in the analysis, but due to the nearshore proximity of the cofferdams, grid cells that overlapped partially with land and water were included in the analysis. For two species guilds (*i.e.*, pinnipeds and pilot whale *spp.*), minor adjustments were necessary as the Roberts *et al.* (2023) data did not separate these by species. In these two cases, the densities were scaled by the relative abundance of each species, as described in the final 2022 SARs (Hayes *et al.*, 2023).

Annual maximum marine mammal exposures were calculated assuming that cofferdam activities would only occur during the activity window of September through May. The density value for each species represented the highest density month for each specific species within this window, so as to not underestimate any potential take when the activity would occur. The exposures were calculated using the following static formula:

$$Exposures = area\ ensonified \times (days) \times density,$$

where the *area ensonified* is equal to $\pi \times r^2$, wherein *r* is equal to the Level B harassment isopleth distance, *days* constituted the total number of days needed for cofferdam activities (*n*=28), and *density* were incorporated as species-specific during the activity window.

The exposure estimates were calculated assuming 6 days of installation and 6 days of removal at the Atlantic City landfall location (*n*=12), and 8 days of installation and 8 days of removal at the Monmouth landfall location (*n*=28), equating to 28 days in total. In their adequate and complete ITA application, Project Company 1 initially proposed 16 days total for the Atlantic City landfall location (8 days of installation and 8 days of removal). However, given the shallower waters at this location, they believe that it would be possible to install and remove the temporary cofferdams more quickly than initially modeled, thus reducing the total number of days at this location (*n*=12). Where applicable, calculated exposure estimates were then adjusted up for average group sizes, per table 10, to yield the allowed take numbers. The estimated take, representing the maximum amount of take that is reasonably expected to occur during temporary cofferdam installation and removal during the Project, is provided in table 19. As already stated, no take by Level A harassment is expected, nor has it been requested by Project Company 1 or allowed by NMFS.

TABLE 19—THE MAXIMUM PREDICTED LEVEL B HARASSMENT EXPOSURES, AND TAKES THAT ARE REASONABLY EXPECTED TO OCCUR BY LEVEL B HARASSMENT ALLOWED FOR COFFERDAM ACTIVITIES, INCLUDING A GROUP SIZE ADJUSTMENT^{a b}

Marine mammal species	Atlantic City landfall site—2025		Monmouth landfall site—2026	
	Calculated exposures	Takes by Level B harassment	Calculated exposures	Takes by Level B harassment
North Atlantic right whale *	1.15	4	1.23	4
Fin whale *	0.65	2	4.14	5
Humpback whale	1.43	2	4.70	5
Minke whale	1.70	2	18.66	19
Sei whale	0.23	3	1.62	3
Sperm whale	0.03	2	0.28	2
Atlantic spotted dolphin	0.18	100	1.16	100
Atlantic white-sided dolphin	0.64	22	7.31	22
Bottlenose dolphin (offshore stock)	0	0	307.29	308
Bottlenose dolphin (coastal stock)	1,835.55	1,836	607.29	608
Common dolphin	6.56	7	73.01	74
Long-finned pilot whale ^c	0	6	0.01	6
Short-finned pilot whale ^c	0	2	0.01	2
Risso's dolphin	0.03	20	0.70	20
Harbor porpoise	10.28	11	98.23	99
Gray seal	113.04	114	158.86	159
Harbor seal	253.99	254	356.92	357

Note: * denotes species listed under the Endangered Species Act.

^a Group size for adjustments can be found in table 10.

^b The Atlantic City landfall site installation and removal is in Year 1; Monmouth landfall site installation and removal is in Year 2.

^c Project Company 1 has requested a single group size for these species.

Known haul-outs for seals occur near the coastal cofferdam locations (*i.e.*, Great Bay, Sandy Hook, and Barnegat Inlet), per Conserve Wildlife Foundation of New Jersey (2015). However, there is no evidence that these haul-out locations also coincide with important foraging sites. Given the distance for which we expect Project Company 1's activities to occur, away from the more inland regions of New Jersey, NMFS does not expect that in-air sounds produced would cause the take of hauled-out pinnipeds. Therefore, NMFS does not expect any harassment to occur and has not allowed any take from in-air impacts on hauled-out seals.

HRG Surveys

Project Company 1's planned HRG survey activities include the use of impulsive (*i.e.*, sparkers) and non-impulsive sources (*i.e.*, Compressed High Intensity Radiated Pulses (CHIRPs)) that have the potential to harass marine mammals. Other equipment is also planned, but is not expected to cause harassment of marine mammals. The list of all equipment

planned to be used is in table 2 of the proposed rule (88 FR 65430, September 22, 2023), with more information found in Project Company 1's ITA application on NMFS' website at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. This list includes sparkers, CHIRPs, INNOMAR sub-bottom profilers, gradiometers, side-scan sonar, and multibeam echosounders.

Allowed takes are only by Level B harassment, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to noise from certain HRG acoustic sources. Specific to HRG surveys, in order to better consider the narrower and directional beams of the sources, NMFS has developed a calculation tool, available at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>, for determining the distances at which sound pressure level (SPL_{rms}) generated from HRG surveys reach the 160 dB threshold. The equations in the tool

consider water depth, frequency-dependent absorption and some directionality to refine estimated ensonified zones. Project Company 1 used NMFS' methodology with additional modifications to incorporate a seawater absorption formula and account for energy emitted outside of the primary beam of the source. For sources operating with different beamwidths, the beamwidth associated with operational characteristics reported in Crocker and Fratantonio (2016) was used.

The isopleth distances corresponding to the Level B harassment threshold for each type of HRG equipment with the potential to result in harassment of marine mammals were calculated per NOAA Fisheries' Interim Recommendation for Sound Source Level and Propagation Analysis for High Resolution Geophysical Sources. The distances to the Level B harassment isopleth are presented in table 20. Please refer to appendix C for a full description of the methodology and formulas used to calculate distances to the Level B harassment threshold.

TABLE 20—DISTANCES CORRESPONDING TO THE LEVEL B HARASSMENT THRESHOLD FOR HRG EQUIPMENT OPERATING BELOW 180 KHZ

HRG survey equipment type	Representative equipment type	Horizontal distance (m) to the Level B harassment threshold	Ensonified area (km ²)
Sparkers	Applied Acoustics Dura-Spark 240 ^a	^b 282	15.57
	GeoMarine Geo-Source ^a	^c 141	
Compressed High Intensity Radiated Pulses (CHIRPs)	Edgetech 2000–DSS	56	
	Edgetech 216	9	
	Edgetech 424	10	
	Edgetech 512i	9	
	Pangeosubsea Sub-Bottom Imager™	32	

^a After additional information was provided from Project Company 1, NMFS believes that the operational parameters of the acoustic sources planned for use during HRG surveys were inadvertently switched for the Applied Acoustics Dura-Spark 240 and the GeoMarine Geo-Source.

^b Based on a source level of 209 dB for the 240 tip configuration of the Applied Acoustics Dura-Spark operating at 500 J, as taken from Crocker and Fratantonio (2016). This configuration was included in the ITA application and proposed rule but was incorrectly attributed a source level of 203 dB. Notably, this source is not planned for use during the survey according to additional information provided from Project Company 1, but the corrected distance to Level B Harassment threshold is nevertheless included for completeness.

^c Given the inadvertent error NMFS has noted in the ITA application, and after review of the data found within Crocker and Fratantonio (2016), we believe that the horizontal distance for the Geo-Marine Geo-Source is actually 141 m (463 ft), rather than 56 m (184 ft), as originally described in the proposed rule. We have made the relevant adjustment here to better reflect the data available.

The survey activities that have the potential to result in Level B harassment (160 dB SPL) include the noise produced by sparkers and CHIRPs. Per the table 22 of the proposed rule, which is also reflected in the ITA application, this indicates that the Applied Acoustics Dura-Spark 240 results in the greatest calculated distance to the Level B harassment criteria at 141 m (463 ft). However, as of July 2024, Project Company 1 has further clarified to NMFS that they intend to primarily

utilize the Geo Marine Geo-source sparker, rather than the Applied Acoustics Dura-Spark 240 as previously described in their ITA application and in the proposed rule (88 FR 65430, September 22, 2023). Project Company 1 anticipates this acoustic source to nominally operate using 400 tips at 400 J of energy. Based on this information, the most representative proxy equipment from Crocker and Fratantonio (2016) appears to be the Dura-Spark operating with 400 tips and

500 J, which was measured to have a source level of 203 dB (Crocker and Fratantonio, 2016), which corresponds to a horizontal distance to the Level B harassment threshold of 141 m (463 ft). Based on this, and after evaluating the provided operational characteristics of the Dura-Spark 240 and the GeoMarine Geo-Source from Crocker and Fratantonio (2016), NMFS found that the wrong operational parameters were incorrectly assigned to the representative sparker equipment in the

ITA application, subsequent supporting documents, and, therefore, in the proposed rulemaking. We have re-evaluated these two sources and their operational characteristics and found that the 141 m (463 ft) distance carried forward from the initial analysis remains the most appropriate distance to the Level B harassment threshold for sparker activities and does not necessitate any changes to this rulemaking or the analysis herein.

The total area ensonified was estimated by considering the distance of the daily vessel track line (determined using the estimated average speed of the vessel and the 24-hour operational period within each of the corresponding survey segments) and the longest horizontal distance to the relevant acoustic threshold from an HRG sound source (full formula in section 6 of the ITA application and in the Revised HRG Memo on NMFS' website). Using the larger distance of 141 m (462.6 ft) to the 160 dB_{RMS90%} re 1 µPa Level B harassment isopleth (table 20), the estimated daily vessel track of approximately 55 km (34.2 mi) per vessel for 24-hour operations, inclusive of an additional circular area to account for radial distance at the start and end of a 24-hour cycle, estimates of the total area ensonified to the Level B harassment threshold per day of HRG surveys were calculated (table 20).

Exposure calculations assumed that there would be 60 days of HRG surveying per year over each of the 5 years. As described in the ITA application, density data were mapped within the boundary of the Project Area using geographic information systems. These data were updated based on the revised data from the Duke University

density models (Roberts *et al.* 2016a; Roberts *et al.*, 2023)). Because the exact dates of HRG surveys are unknown, the maximum average seasonal density values for each marine mammal species was used and carried forward in the take calculations (table 9).

The calculated exposure estimates based on the exposure modeling methodology described above were compared with the best available information on marine mammal group sizes. Group sizes used for HRG take estimates were the same as those used for impact pile driving take estimation (see table 10). Project Company 1 also used data collected by PSOs on survey vessels operating during HRG surveys in their 2020 season in the relevant Project Area. It was determined that the calculated number of potential takes by Level B harassment based on the exposure modeling methodology above may be underestimates for some species and therefore warranted adjustment using group size estimates and PSO data to ensure conservatism in the take numbers allowed. Despite the relatively small modeled Level B harassment zone (141 m (462.6 ft)) for HRG survey activities, it was determined that adjustments to the requested numbers of take by Level B harassment for some dolphin species was warranted (see table 21 below).

For certain species for which the density-based methodology described above may result in potential underestimates of take and Project Company 1's PSO sightings data were relatively low, adjustments to the exposure estimates were made based on the best available information on marine mammal group sizes to ensure conservatism. For species with densities

too low in the region to provide meaningful modeled exposure estimates, the take request is based on the average group size (table 10). Other adjustments were made based on information previously presented in IHAs issued to Atlantic Shores (the precursor to Project Company 1 for OCS-A-0499 and OCS-A-0570). These include an estimate of 1.55 individuals of common dolphins per day multiplied by the number of survey days annually (*i.e.*, 60 days), which is in alignment with what was done in the IHA issued to Atlantic Shores/Project Company 1 on April 22, 2022 (87 FR 24103) based on previous daily observations of common dolphins. Additionally, requested take estimates for long-finned pilot whales, Atlantic spotted dolphins, and Risso's dolphins were also adjusted based on typical group sizes (*i.e.*, 20, 100, and 30 annual takes, respectively), based on take numbers from 2020, 2021, and 2022 IHAs issued to Atlantic Shores (see <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable#expired-authorizations>). Lastly, adjustments were made for short-finned pilot whales based on group size data reported by the OBIS data repository (OBIS, 2022). The average group size used consisted of six individuals.

The maximum seasonal density used for the HRG survey analysis are shown in table 9 in the *Density and Occurrence* section. The calculated exposures, annual allowed take, and the total 5-year allowed take (all by Level B harassment only) is found in table 21 below.

TABLE 21—CALCULATED EXPOSURES, AND ALLOWED TAKE, AND 5-YEAR ALLOWED TAKE BY LEVEL B HARASSMENT ONLY DURING ANNUAL HRG SURVEYS FOR THE ATLANTIC SHORES SOUTH SURVEY AREA ^a

Marine mammal species	Stock	Calculated exposures	Annual allowed take by Level B harassment	Total 5-year allowed take by Level B harassment ^e
North Atlantic right whale *	Western Atlantic	1	1	5
Fin whale *	Western North Atlantic	2	2	10
Humpback whale	Gulf of Maine	1	1	5
Minke whale	Canadian Eastern Coastal	4	4	20
Sei whale *	Nova Scotia	1	^b 2	10
Sperm whale *	Western North Atlantic	1	1	5
Atlantic spotted dolphin	Western North Atlantic	1	100	500
Atlantic white-sided dolphin	Western North Atlantic	3	3	15
Bottlenose dolphin	Northern Migratory Coastal	113	113	565
	Western North Atlantic—Offshore	225	225	1,125
Common dolphin	Western North Atlantic	14	^d 93	465
Long-finned pilot whale	Western North Atlantic	1	^c 20	100
Short-finned pilot whale	Western North Atlantic	1	^c 6	30
Risso's dolphin	Western North Atlantic	1	^c 30	150
Harbor porpoise	Gulf of Maine/Bay of Fundy	24	24	120
Gray seal	Western North Atlantic	41	41	205

TABLE 21—CALCULATED EXPOSURES, AND ALLOWED TAKE, AND 5-YEAR ALLOWED TAKE BY LEVEL B HARASSMENT ONLY DURING ANNUAL HRG SURVEYS FOR THE ATLANTIC SHORES SOUTH SURVEY AREA ^a—Continued

Marine mammal species	Stock	Calculated exposures	Annual allowed take by Level B harassment	Total 5-year allowed take by Level B harassment ^e
Harbor seal	Western North Atlantic	91	91	455

Note: * denotes species listed under the Endangered Species Act.

^a The survey area accounts for waters within and around the Lease Areas and the export cable routes.

^b Project Company 1 is requesting 1 additional take of sei whales, for a total of two, based on the average group size found in NOAA (2022) and due to an encounter during their 2020 surveys where a single sei whale was observed.

^c This adjustment was made in alignment with take that was previously authorized to Project Company 1 in an issued IHA (88 FR 38821, June 14, 2023). As the survey area for this final rulemaking overlaps the survey area for that IHA the same group size assumptions were used in this analysis.

^d This adjustment was made in alignment with the take that was previously authorized to Project Company 1 in an issued IHA (88 FR 38821, June 14, 2023) where an average take of 1.5 individuals per day was multiplied by the total number of survey days (*i.e.*, 60 days).

^e NMFS added this column to provide more clarity regarding the total number of allowed takes over the entire 5-year effective period from HRG surveys.

Total Take Across All Activities

The number of takes by Level A harassment and Level B harassment allowed during permanent WTG, OSS, and Met Tower foundation installation, cable landfall construction (*i.e.*, temporary cofferdams), and HRG surveys are presented in table 22. The mitigation and monitoring measures provided in the Mitigation and Monitoring and Reporting sections are activity-specific and are designed to minimize, to the extent practicable, acoustic exposures to marine mammal species.

The amount of take that Project Company 1 requested, and NMFS is authorizing, is substantially conservative. For the species for which modeling was conducted, the take estimates are conservative for a number of key reasons:

- The amount of allowed take assumes the largest and longest buildout scenario, with respect to Project design and Schedules. To estimate the maximum amount of take that is reasonably expected to occur, we carried forward the Schedules (Scenario 1 and modified Scenario 2) that assumed two years of pile driving as this could be reasonably likely to constitute more takes over more days given the longer duration of foundation pile driving activities. We then carried forward the schedule that would require the most impact driven piles to be installed (modified Scenario 2), as Project 1’s WTG buildout would use monopiles, but Project 2’s could potentially require jackets with pin piles or monopiles, but jacket foundations would require the installation of more piles to maintain the stability of the structure. Closer to construction, if Project Company 1 opts to build the Project 2 WTGs out as monopiles rather

than jackets, fewer total piles would be installed;

- As described in the *Detailed Description of Specified Activities* section and Project Company 1’s PDE Refinement memo, Project Company 1 may use suction-buckets or gravity-based structures to install the foundations for the Met Tower and may use suction-buckets for each of the OSSs rather than monopiles or jacket foundations (depending on the size OSS used). Should Project Company 1 decide to use these different foundations, take of marine mammals would not occur as noise levels would not be elevated to the degree there is a potential for take (*i.e.*, no pile driving is involved with installing suction buckets);

- The amount of Level A harassment allowed considered the maximum of up to two monopiles or four pin piles being installed per day, when Project Company 1 may choose to, on some days, install fewer pin piles than this;

- Regarding the OSS buildout, while we analyzed a construction scenario assuming the largest OSSs would be built (*i.e.*, four large) instead of medium or small OSSs, we conservatively accounted for a longer number of piling days per each OSS with the maximum number of piles that may be used, depending on the buildout chosen for OSSs in Project 1 and Project 2. If Project Company 1 further refines their Project buildout during construction to small or medium OSSs, rather than all large, although more total structures and pin piles would be collectively installed, these would likely be installed over a longer period of time and over a larger area (*i.e.*, the pin piles would be less concentrated in any given area), given the footprint of 10 OSSs versus 4 OSSs. This in turn would reduce the overall duration of this construction activity;

- For foundation pile driving, which is responsible for the majority of the take for all species, all calculated take incorporated the maximum average densities for any given species in any given season that coincided with the planned pile driving activities while maximum monthly densities and maximum average seasonal densities were used for temporary cofferdams and HRG surveys, respectively. These values are likely lower for some species, but the value used in the analysis for each activity would be driven by periods of higher densities; and

- The amount of allowed Level A harassment does not fully account for the likelihood that marine mammals would avoid a stimulus when possible before the individual accumulates enough acoustic energy to potentially cause auditory injury, or, importantly, the effectiveness of the required monitoring and mitigation measures in reducing exposures (with the exception of North Atlantic right whales given the enhanced mitigation measures required for this species). Therefore, actual anticipated exposures should be less than those analyzed here.

Additionally, as described in the proposed rule (88 FR 65430, September 22, 2023), NMFS used the best available science and robust models to consider the interaction of marine mammal movement, the environment, and the Project’s activities, in the context of NMFS’ acoustic thresholds, to project the maximum number of takes by Level A harassment and Level B harassment that are reasonably expected to occur. However, NMFS has also acknowledged the uncertainty inherent in certain input values (*e.g.*, source levels and spectra) and environmental variability present in real-life physical and biological systems. Accordingly, while activity-specific take estimates are appropriately used to

build as accurate of a total take estimate as possible, allowable takes are presented in the LOA as total maximum annual takes and 5-year takes by both Level A harassment and Level B harassment, and not specifically by activity type (*i.e.*, the regulations simply indicate the species or stocks that may

be taken). In other words, the LOA specifies maximum annual and 5-year takes that may not be exceeded, by Level A and Level B harassment, but does not specify the number of allowable takes by activity type, thus allowing for flexibility should the number of takes from a specific activity

type exceed the number modeled for the specific activity type, provided the manner and impacts of those takes remain within those considered within the analysis and the total takes remain below the annual maximum and 5-year totals.

TABLE 22—ESTIMATED ANNUAL TAKES, BY LEVEL A HARASSMENT AND LEVEL B HARASSMENT, FOR THE PROJECT OVER 5 YEARS

Marine mammal species	Stock	NMFS stock abundance ^a	Year 1 (2025)		Year 2 (2026)		Year 3 (2027)		Year 4 (2028)		Year 5 (2029)	
			Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
North Atlantic right whale ^{*b,d}	Western Atlantic	340	0	5	0	13	0	5	0	1	0	1
Fin whale ^{*d}	Western North Atlantic ..	6,802	0	4	4	18	4	12	0	2	0	2
Humpback whale	Gulf of Maine	1,396	0	3	4	17	4	4	0	1	0	1
Minke whale	Canadian Eastern Coastal.	21,968	0	6	12	161	17	146	0	4	0	4
Sei whale ^{*b,d}	Nova Scotia	6,292	0	5	2	11	1	5	0	2	0	2
Sperm whale ^{*b,d}	Western North Atlantic ..	5,895	0	3	0	7	0	3	0	1	0	1
Atlantic spotted dolphin ^{b,c,d}	Western North Atlantic ..	31,506	0	200	0	400	0	200	0	100	0	100
Atlantic white-sided dolphin ^d	Western North Atlantic ..	93,233	0	25	1	207	1	175	0	3	0	3
Bottlenose dolphin	Western North Atlantic—Offshore.	64,587	0	225	0	3,836	0	3,642	0	225	0	225
	Northern Migratory Coastal ^b .	6,639	0	1,949	0	786	0	126	0	113	0	113
Common dolphin ^e	Western North Atlantic ..	93,100	0	100	0	370	0	250	0	93	0	93
Long-finned pilot whale ^{b,c,d}	Western North Atlantic ..	39,215	0	26	0	66	0	40	0	20	0	20
Short-finned pilot whale ^{b,c,d}	Western North Atlantic ..	18,726	0	8	0	20	0	12	0	6	0	6
Risso's dolphin ^{b,c,d}	Western North Atlantic ..	44,067	0	50	2	110	1	60	0	30	0	30
Harbor porpoise	Gulf of Maine/Bay of Fundy.	85,765	0	35	8	191	13	64	0	24	0	24
Gray seal	Western North Atlantic ..	27,911	0	155	2	323	2	136	0	41	0	41
Harbor seal	Western North Atlantic ..	61,336	0	345	4	738	8	305	0	91	0	91

Note: * denotes species listed under the Endangered Species Act.

^a In the proposed rule (88 FR 65430, September 22, 2023), NMFS utilized the 2022 final SARs (Hayes et al., 2023); however, in this final rule, NMFS utilized the 2023 draft SARs (<https://www.fisheries.noaa.gov/hatteras/marine-mammal-protection/marine-mammal-stock-assessment-reports>) were used for the stock abundances.

^b The take estimate by Level B harassment for foundation installation via impact pile driving was rounded up to 1 average group size; impact pile driving is scheduled to occur during Year 2 and Year 3 of the proposed rulemaking. While the foundation installation schedule (table 14) counted the total number of WTGs plus 6 WTGs in the Overlap Area for both Project 1 and Project 2, the take by Level A harassment or Level B harassment requested (table 17) is based on those 6 WTGs occurring under Project 2; no double counting of take occurred.

^c The take estimate by Level B harassment for HRG surveys was rounded up to 1 group size; HRG surveys are planned to occur during the entire 5-year effective period of the rulemaking.

^d The take estimate by Level B harassment for temporary cofferdams via vibratory pile driving was rounded up to 1 group size; temporary cofferdam installation and removal is expected to occur during Year 1 and 2 of the rulemaking.

^e The take estimate by Level B harassment for common dolphins is derived by the daily sighting rate for previous HRG surveys multiplied by the number of HRG survey or pile driving days that would occur for each specific activity.

TABLE 23—TOTAL TAKES ALLOWED FOR THE PROJECT ACROSS THE 5-YEAR EFFECTIVE PERIOD OF THE RULE
 [By Level A harassment and Level B harassment]

Marine mammal species	Stock	NMFS stock abundance ^a	Allowed Level A harassment ^b	Allowed Level B harassment ^b	5-Year total allowed take ^b
North Atlantic right whale *	Western Atlantic	340	0	25	25
Fin whale *	Western North Atlantic	6,802	8	38	46
Humpback whale	Gulf of Maine	1,396	8	33	41
Minke whale	Canadian Eastern Coastal	21,968	29	321	360
Sei whale *	Nova Scotia	6,292	3	25	28
Sperm whale *	Western North Atlantic	5,895	0	15	15
Atlantic spotted dolphin ^c	Western North Atlantic	31,506	0	1,000	1,000
Atlantic white-sided dolphin ^c	Western North Atlantic	93,233	2	413	415
Bottlenose dolphin	Western North Atlantic—Offshore	64,587	0	8,153	8,153
	Northern Migratory Coastal	6,639	0	3,087	3,087
Common dolphin	Western North Atlantic	93,100	0	906	906
Long-finned pilot whale	Western North Atlantic	39,215	0	172	172
Short-finned pilot whale	Western North Atlantic	18,726	0	52	52
Risso's dolphin	Western North Atlantic	44,067	3	280	283
Harbor porpoise	Gulf of Maine/Bay of Fundy	85,765	21	338	359
Gray seal	Western North Atlantic	27,911	4	696	700
Harbor seal	Western North Atlantic	61,336	12	1,570	1,582

Note: * denotes species listed under the Endangered Species Act.

^a In the proposed rule (88 FR 65430, September 22, 2023), NMFS utilized the 2022 final SARs (Hayes *et al.*, 2023); however, in this final rule, NMFS utilized the 2023 draft SARs (<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>) were used for the stock abundances.

^b Within the proposed rule (88 FR 65430, September 22, 2023), NMFS had initially used the maximum take that is reasonably expected to occur for each of Project 1 and Project 2's buildout; however, given both Projects would be constructed, this has been corrected to sum the values.

^c During the drafting of the proposed rule (88 FR 65430, September 22, 2023), the total take by Level A harassment and Level B harassment was inadvertently flipped between these 2 species. NMFS has fixed that error for this final rule.

To inform both the negligible impact analysis and the small numbers determination, NMFS assesses the maximum number of marine mammal takes that are allowable within any given year (noting that the negligible impact determination is also informed by the 5-year take total). For this maximum annual take calculation, the maximum allowable number of Level A harassment takes in any one year is summed with the maximum allowable number of Level B harassment takes in any one year for each species to yield the highest number of estimated take that could occur in any year (table 24). Table 24 also depicts the number of takes relative to the abundance of each stock. The takes enumerated here represent instances of take (each occurring within one day), not necessarily individual marine mammals taken. One take represents a day (24-hour period) in which an animal was exposed to noise above the associated

harassment threshold at least once. Some takes represent a brief exposure above a threshold, while in some cases takes could represent a longer, or repeated, exposure of one individual animal above a threshold within a 24-hour period. Whether or not every take assigned to a species represents a different individual depends on the daily and seasonal movement patterns of the species in the area. For example, activity areas with continuous activities (all or nearly every day) overlapping known feeding areas (where animals are known to remain for days or weeks on end) or areas where species with small home ranges live (*e.g.*, some pinnipeds) are more likely to result in repeated takes to some individuals. Alternatively, activities far out in the deep ocean or takes to nomadic species where individuals move over the population's range without spatial or temporal consistency represent circumstances where repeat takes of the same

individuals are less likely. In other words, for example, 100 takes could represent 100 individuals each taken on 1 day within the year, or it could represent 5 individuals each taken on 20 days each within the year, or some other combination depending on the activity, whether there are biologically important areas in the Project Area, and the daily and seasonal movement patterns of the species of marine mammals exposed. Wherever there is information to better contextualize the enumerated takes for a given species is available, it is discussed in the Negligible Impact Analysis and Determination and/or Small Numbers sections, as appropriate. We recognize that certain activities could shift within the 5-year effective period of the rule; however, the rule allows for that flexibility and the takes are not expected to exceed those shown in table 24 in any one year.

TABLE 24—MAXIMUM NUMBER OF TAKES ALLOWED FOR THE PROJECT IN ANY ONE YEAR UNDER THE RULE
[By Level A harassment and Level B harassment]

Marine mammal species	Stock	NMFS stock abundance ^a	Maximum annual Level A harassment	Maximum annual Level B harassment	Maximum annual take in any one year (maximum Level A harassment + maximum Level B harassment)	Total percent stock taken in any one year based on maximum annual take ^b
North Atlantic right whale *	Western Atlantic	340	0	13	13	3.82
Fin whale *	Western North Atlantic	6,802	4	18	22	0.32
Humpback whale	Gulf of Maine	1,396	4	17	21	1.50
Minke whale	Canadian Eastern Coastal	21,968	17	161	178	0.81
Sei whale *	Nova Scotia	6,292	2	11	13	0.21
Sperm whale *	Western North Atlantic	5,895	0	7	7	0.12
Atlantic spotted dolphin	Western North Atlantic	31,506	0	400	400	1.27
Atlantic white-sided dolphin	Western North Atlantic	93,233	1	207	208	0.22
Bottlenose dolphin	Western North Atlantic—Off-shore.	64,587	0	3,836	3,836	5.94
	Northern Migratory Coastal	6,639	0	1,949	1,949	29.36
Common dolphin	Western North Atlantic	93,100	0	370	370	0.40
Long-finned pilot whale	Western North Atlantic	39,215	0	66	66	0.17
Short-finned pilot whale	Western North Atlantic	18,726	0	20	20	0.11
Risso's dolphin	Western North Atlantic	44,067	2	110	112	0.25
Harbor porpoise	Gulf of Maine/Bay of Fundy ...	85,765	13	191	204	0.24
Gray seal	Western North Atlantic	27,911	2	323	325	1.16
Harbor seal	Western North Atlantic	61,336	8	738	746	1.22

Note: * denotes species listed under the Endangered Species Act.

^a In the proposed rule (88 FR 65430, September 22, 2023), NMFS utilized the 2022 final SARs (Hayes *et al.*, 2023); however, in this final rule, NMFS utilized the 2023 draft SARs (<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>) were used for the stock abundances.

^b The percentages presented here are simplistic, assuming that each take is of a different individual; however, that is a conservative assessment.

Mitigation

As described in the Changes From the Proposed to Final Rule section, we have made changes to some mitigation measures from the proposed rule. These changes are described in detail in the sections below. Otherwise, the mitigation requirements have not changed from the proposed rule.

In order to promulgate a rulemaking under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable adverse 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 (the latter is not applicable for this action). NMFS' regulations require applicants for ITAs 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, we carefully consider two primary factors:

- (1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (e.g., likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (*i.e.*, probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (*i.e.*, probability implemented as planned); and
- (2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, personnel safety, practicality of implementation, and, in the case of a military readiness activity, impact on the effectiveness of the military readiness activity.

The mitigation strategies described below are consistent with those required

and successfully implemented under previous ITAs issued in association with in-water construction activities (e.g., soft-start, establishing shutdown zones). Additional measures have also been incorporated to account for the fact that the construction activities would occur offshore. Modeling was performed to estimate harassment zones, which were used to inform mitigation measures for the Project's activities to minimize Level A harassment and Level B harassment to the extent practicable, while providing estimates of the areas within which harassment might occur.

Generally speaking, the mitigation measures considered and required here fall into three categories: (1) spatio-temporal (*i.e.*, seasonal and daily) work restrictions; (2) real-time measures (*i.e.*, shutdown, clearance, and vessel strike avoidance); and (3) noise attenuation/reduction measures. Spatio-temporal restrictions, such as seasonal work restrictions, are designed to avoid or minimize operations when marine mammals are concentrated or engaged in behaviors that make them more susceptible or make impacts more likely. Such restrictions reduce both the number and severity of potential takes and are effective in reducing both

chronic (*i.e.*, longer-term) and acute effects. Real-time measures, such as implementation of shutdown and clearance zones, as well as vessel strike avoidance measures, are intended to reduce the probability or severity of harassment by taking steps in real time once a higher-risk scenario is identified (*e.g.*, once animals are detected within an impact zone). Noise attenuation measures, such as bubble curtains, are intended to reduce the noise at the source, which reduces both acute impacts, as well as the contribution to aggregate and cumulative noise that may result in chronic impacts.

Below, we briefly describe the required training, coordination, and vessel strike avoidance measures that apply to all specified activities and then we describe the measures that apply to specific specified activities (*i.e.*, foundation installation, nearshore installation and removal activities for cable laying, and HRG surveys). Specific requirements can be found in Section 217.304 (Mitigation requirements) as found in Part 217—Regulations Governing The Taking And Importing Of Marine Mammals at the end of this rulemaking.

Training and Coordination

NMFS requires all of Project Company 1's employees and contractors conducting activities on the water, including, but not limited to, all vessel captains and crew to be trained in marine mammal detection and identification, communication protocols, and all required measures to minimize impacts on marine mammals and support Project Company 1's compliance with the LOA, if issued. Additionally, all relevant personnel and the marine mammal species monitoring team(s) are required to participate in joint, onboard briefings prior to the beginning of Project activities. The briefing must be repeated whenever new relevant personnel (*e.g.*, new PSOs, construction contractors, relevant crew) join the Project before work commences. During this training, Project Company 1 is required to instruct all Project personnel regarding the authority of the marine mammal monitoring team(s). For example, the HRG acoustic equipment operator, pile driving personnel, *etc.*, is required to immediately comply with any call for a delay or shut down by the Lead PSO. Any disagreement between the Lead PSO and the Project personnel must only be discussed after delay or shutdown has occurred. In particular, all captains and vessel crew must be trained in marine mammal detection and vessel strike avoidance measures to

ensure marine mammals are not struck by any Project or Project-related vessel.

Prior to the start of in-water construction activities, vessel operators and crews would receive training about marine mammals and other protected species known or with the potential to occur in the Project Area, making observations in all weather conditions, and vessel strike avoidance measures. In addition, training would include information and resources available regarding applicable Federal laws and regulations for protected species. Project Company 1 will provide documentation of training to NMFS.

North Atlantic Right Whale Awareness Monitoring

Project Company 1 would be required to use available sources of information on North Atlantic right whale presence, including daily monitoring of the Right Whale Sightings Advisory System, NMFS' website at: <https://www.fisheries.noaa.gov/national/Endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>, and monitoring the U.S. Coast Guard's very high frequency (VHF) Channel 16 throughout each day to receive notifications of any sightings, and information associated with any regulatory management actions (*e.g.*, establishment of a zone identifying the need to reduce vessel speeds). Maintaining daily awareness and coordination affords increased protection of North Atlantic right whales by understanding North Atlantic right whale presence in the area through ongoing visual and PAM efforts and opportunities (outside of Project Company 1's efforts), and allows for planning of construction activities, when practicable, to minimize potential impacts on North Atlantic right whales.

Vessel Strike Avoidance Measures

This final rule contains numerous vessel strike avoidance measures that reduce the risk that a vessel and marine mammal could collide. While the likelihood of a vessel strike is generally low, they are one of the most common ways that marine mammals are seriously injured or killed by human activities. Therefore, enhanced mitigation and monitoring measures are required to avoid vessel strikes to the extent practicable. While many of these measures are proactive intending to avoid the heavy use of vessels during times when marine mammals of particular concern may be in the area, several are reactive and occur when a Project personnel sights a marine mammal. The mitigation requirements are described generally here and in

detail in the regulation text at the end of this final rule (see 50 CFR 217.304(b)). Project Company 1 will be required to comply with these measures except under circumstances when doing so would create an imminent and serious threat to a person or vessel or to the extent that a vessel is unable to maneuver and, because of the inability to maneuver, the vessel cannot comply.

While underway, Project Company 1 is required to monitor for, and maintain a minimum separation distance from, marine mammals and operate vessels in a manner that reduces the potential for vessel strike. Regardless of the vessel's size, all vessel operators, crews, and dedicated visual observers (*i.e.*, PSO or trained crew member) must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course (as appropriate) to avoid striking any marine mammal. The dedicated visual observer, equipped with suitable monitoring technology (*e.g.*, binoculars, night vision devices), must be located at an appropriate vantage point for ensuring vessels are maintaining required vessel separation distances from marine mammals (*e.g.*, 500 m (1,640 ft) from North Atlantic right whales).

All Project vessels, regardless of size, must maintain the following minimum separation zones: (1) 500 m (1,640 ft) from North Atlantic right whales; (2) 500 m (1,640 ft) from ESA-listed large whales (*i.e.*, sperm whales, fin whales, sei whales) and any unidentifiable large whales; (3) 100 m (328 ft) from non-ESA listed large whales (*i.e.*, humpback whale, minke whale); and (4) 50 m (164 ft) from all delphinid cetaceans and pinnipeds (an exception is made for those species that approach the vessel (*i.e.*, bow-riding dolphins)). If any of these species are sighted within their respective minimum separation zone, the underway vessel must shift its engine to neutral and the engines must not be engaged until the animal(s) has been observed to be outside of the vessel's path and beyond the respective minimum separation zone. If a North Atlantic right whale is observed at any distance by any Project personnel or acoustically detected, Project vessels must reduce speeds to 10 kn (11.5 mph). Additionally, in the event that any Project-related vessel, regardless of size, observes any large whale (other than a North Atlantic right whale) within 500 m (1,640 ft) of an underway vessel, the vessel is required to shift engines into neutral. The vessel shall remain in neutral until the whale has moved beyond 500 m (1,640 ft) and the 10 kn (11.5 mph) speed restriction will remain

in effect as outlined in 50 CFR 217.304(b).

All of the Project-related vessels are required to comply with existing NMFS vessel speed restrictions for North Atlantic right whales and the measures within this rulemaking for operating vessels around North Atlantic right whales and other marine mammals. When NMFS vessel speed restrictions are not in effect and a vessel is traveling at greater than 10 kn (11.5 mph), in addition to the required dedicated visual observer, Project Company 1 is required to monitor the crew transfer vessel transit corridor (the path crew transfer vessels take from port to any work area) in real-time with PAM prior to and during transits. To maintain awareness of North Atlantic right whale presence, vessel operators, crew members, and the marine mammal monitoring team will monitor U.S. Coast Guard VHF Channel 16, NMFS' website at: <https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>, WhaleAlert, the Right Whale Sighting Advisory System (RWSAS), and the PAM system. Any marine mammal observed by Project personnel must be immediately communicated to any on-duty PSOs, PAM operator(s), and all vessel captains. Any North Atlantic right whale or large whale observation or acoustic detection by PSOs or PAM operators must be conveyed to all vessel captains.

All vessels will be equipped with an AIS and Project Company 1 must report all MMSI numbers to NMFS Office of Protected Resources prior to initiating in-water activities. Project Company 1 will submit a North Atlantic Right Whale Vessel Strike Avoidance Plan for NMFS review and approval at least 180 calendar days prior to commencement of vessel use. Project Company 1's compliance with these measures will reduce the likelihood of vessel strike to the extent practicable. These measures increase awareness of marine mammals in the vicinity of Project vessels and require Project vessels to reduce speed when marine mammals are detected (by PSOs, PAM, and/or through another source (e.g., RWSAS)) and maintain separation distances when marine mammals are encountered. While visual monitoring is useful, reducing vessel speed is one of the most effective, feasible options available to reduce the likelihood of and effects from a vessel strike. Numerous studies have indicated that slowing the speed of vessels reduces the risk of lethal vessel collisions, particularly in areas where right whales are abundant and vessel

traffic is common and otherwise traveling at high speeds (Vanderlaan and Taggart, 2007; Conn and Silber, 2013; Van der Hoop *et al.*, 2014; Martin *et al.*, 2015; Crum *et al.*, 2019).

Seasonal and Daily Restrictions

Spatio-temporal work restrictions in places where marine mammals are concentrated, engaged in biologically important behaviors, and/or present in sensitive life stages are effective measures for reducing the magnitude and severity of human impacts. Seasonal work restrictions provide additional benefits for marine mammals during periods where there could be higher occurrence or presence in the Project Area and specified geographic area. North Atlantic right whales may be present in and around the Project Area throughout the year (e.g., Davis *et al.*, 2017; Roberts *et al.*, 2023; Salisbury *et al.*, 2015). However, it would not be practicable to restrict foundation pile driving year-round. Based upon the best scientific information available (Roberts *et al.*, 2023), the highest densities of North Atlantic right whales in the specified geographic region are expected during the months of January through April, with densities starting to increase in November and taper off in May. Because of this, Project Company 1 planned for, and NMFS is requiring, seasonal work restrictions to minimize the risk of noise exposure to North Atlantic right whales incidental to certain specified activities (i.e., foundation impact pile driving) to the extent practicable. These seasonal work restrictions are expected to greatly reduce the number of takes of North Atlantic right whales. These seasonal restrictions also afford protection to other marine mammals that are known to use the Project Area with greater frequency (e.g., other baleen whales). The seasonal work restrictions would be effective from January 1st through April 30th, with December being allowed to complete Project 1 and/or Project 2 within any given year if NMFS approves. However, to allow Project Company 1 the ability to install the foundations as quickly as possible to shorten the overall construction timeframe and thus shorten the time marine mammals may be subject to construction-related stressors, pile driving in December may occur if necessary to complete Project 1 or Project 2 in any given year upon approval by NMFS. For NMFS to fully consider this request, Project Company 1 must submit a written request to NMFS Office of Protected Resources by October 15th, describing why pile driving in December is necessary to

complete Project 1 or Project 2 within the calendar year including, but not limited to, the following information: (1) installation schedule; (2) pile type(s) (i.e., monopile and/or pin piles) and the maximum number of piles that are predicted/necessary to be installed in December; (3) planned hammer energies planned for use; and (4) any planned or additional protective measures that would or could be implemented to further reduce impacts to protected species during December foundation installation activities. NMFS would consider this and all December pile driving requests for the Project, on a case-by-case basis, alongside submitted PSO and SFV reports that have been previously provided by Project Company 1 leading up to the December pile driving event(s).

Project Company 1 has planned to start to construct the cofferdams around Q2 (April through June) of 2025, for Project 1, and around Q3 (July through September) of 2025, for Project 2, with work expected to continue into 2026 for removal during the effective period of the regulations and LOA (see table 1). However, NMFS is not requiring any seasonal restrictions due to the relatively short duration of work and low associated impacts to marine mammals. Although North Atlantic right whales do migrate in coastal waters, they do not typically migrate very close to shore off of New Jersey and/or within New Jersey bays where nearshore cable landfall work would be occurring. Given the distance to the Level B harassment isopleth is conservatively modeled at approximately 11 km (36,089.2 ft), we expect that any exposure to vibratory pile driving during cofferdams installation and/or removal would be unlikely, and that if exposures occur, they will occur at levels closer to the 120-dB Level B harassment threshold and not at louder source levels. NMFS is not adding any seasonal restrictions to HRG surveys given the limited impacts expected from HRG surveys on marine mammals. However, Project Company 1 would be restricted to only perform a specific amount of 24-hour survey days using up to three survey vessels (assuming each day an individual vessel is operating constitutes a day of vessel effort) within any single year, consistent with the estimated annual effort assumed in the modeling and take calculations ($n=60$ days, annually). This total effort would not exceed the total number of survey days planned during the effective period of these regulations and any LOA, if issued ($n=300$ total days).

Furthermore, NMFS is also requiring some time-of-day temporal restrictions for some of the specified activities. Within any 24-hour period, NMFS proposed that Project Company 1 be limited to installing a maximum of two monopile foundations or four pin piles for jacket foundations; however, on some days Project Company 1 could install less pin piles. NMFS notes that Project Company 1 did request to initiate foundation pile driving during nighttime hours (*i.e.*, 1 hour before civil sunrise and earlier than 1.5 hours before civil sunset) when detection of marine mammals is visually challenging. To date, Project Company 1 has not submitted a plan containing the information necessary, including evidence, that their proposed monitoring systems are capable of detecting marine mammals, particularly large whales, at distances necessary to ensure mitigation measures are effective at night. In general, the scientific literature on these technologies demonstrates there is a high degree of uncertainty in reliably detecting marine mammals at distances necessary for this Project; however, in the proposed rule (88 FR 65430, September 22, 2023), we did request public comments on conditioning the LOA such that nighttime pile driving would only be allowed if Project Company 1 submits an Alternative Monitoring Plan (AMP) to NMFS for approval, prior to foundation pile driving starting, that proves the efficacy of their night vision devices (NVDs) (*e.g.*, mounted thermal/infrared (IR) camera systems and spotlights, hand-held or wearable night vision devices, *etc.*) in detecting protected marine mammals (refer to the Seasonal and Daily Restriction section of the proposed rule (88 FR 65430, September 22, 2023)). If the AMP does not include a full description of the proposed technology, monitoring methodology, and data supporting that marine mammals can reliably and effectively be detected within the clearance and shutdown zones for monopiles and pin piles before and during impact pile driving, nighttime pile driving (unless a pile was initiated 1.5 hours prior to civil sunset and will be allowed to continue) will not be allowed. This AMP should identify the efficacy of the technology at detecting marine mammals in the clearance and shutdown zones under all the various conditions anticipated during construction, including varying weather conditions, sea states, and in consideration of the use of artificial lighting.

Because of this, until this AMP is submitted for NMFS review and approval, under any LOA, if issued, Project Company 1 would be restricted to starting impact pile driving of permanent foundations during daylight hours, defined as, at the latest, 1.5 hours before civil sunset or 1 hour after civil sunrise. If Project Company 1 chooses to provide an AMP, and NMFS reviews and approves it, any subsequent LOA may be further conditioned to allow for nighttime pile driving to occur. Upon submittal by Project Company 1 and approval by NMFS, any final AMP will be made public on NMFS' website (<https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>). Any and all subsequent monitoring reports submitted by Project Company 1 will allow NMFS to continue to evaluate the efficacy of the equipment and the technology. As stated in the proposed rule, we continue to encourage Project Company 1 to further investigate and test advanced technology detection systems and to continue discussions with NMFS on this topic.

Regarding Project Company 1's other construction activities, any and all vibratory pile driving associated with cofferdam installation and removal would only be able to occur during daylight hours.

Lastly, given the very small Level B harassment zone associated with HRG survey activities and no anticipated or allowed Level A harassment, NMFS is not requiring any daily restrictions for HRG surveys.

More information on activity-specific seasonal and daily restrictions can be found in the regulatory text at the end of this rulemaking.

Noise Abatement Systems

Project Company 1 is required to employ NAS, also known as noise attenuation systems, during all foundation installation to reduce the sound pressure levels that are transmitted through the water in an effort to reduce ranges to acoustic thresholds and to minimize, to the extent practicable, any acoustic impacts resulting from these activities. NAS, such as bubble curtains, are used to decrease the sound levels radiated from a source. Bubbles create a local impedance change that acts as a barrier to sound transmission. The size of the bubbles determines their effective frequency band, with larger bubbles needed for lower frequencies. There are a variety of bubble curtain systems, confined or unconfined bubbles, and some with encapsulated bubbles or

panels. Attenuation levels also vary by type of system, frequency band, and location. Small bubble curtains have been measured to reduce sound levels but effective attenuation is highly dependent on depth of water, current, and configuration and operation of the curtain (Austin *et al.*, 2016; Koschinski and Lüdemann, 2013). Bubble curtains vary in terms of the sizes of the bubbles and those with larger bubbles tend to perform better and more reliably, particularly when deployed with two separate rings (Bellmann, 2014; Koschinski and Lüdemann, 2013; Nehls *et al.*, 2016). Encapsulated bubble systems (*i.e.*, Hydro Sound Dampers (HSDs)), can be effective within their targeted frequency ranges (*e.g.*, 100–800 Hz), and when used in conjunction with a bubble curtain appear to create the greatest attenuation. The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices.

The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. Dähne *et al.* (2017) found that single bubble curtains that reduce sound levels by 7 to 10 dB reduced the overall sound level by approximately 12 dB when combined as a double bubble curtain for 6-m (19.7-ft) steel monopiles in the North Sea. During installation of monopiles (consisting of approximately 8-m (26.3-ft) in diameter) for more than 150 WTGs in comparable water depths (>25 m (>82 ft)) and conditions in Europe indicate that attenuation of 10 dB is readily achieved (Bellmann, 2019; Bellmann *et al.*, 2020) using single big bubble curtains for noise attenuation. As a double bubble curtain is required to be used here (a single bubble curtain is not allowed under the framework of this final rule), Project Company 1 is required to maintain numerous operational performance standards. These standards are defined in the regulatory text at the end of this rulemaking, and include, but are not limited to: (1) a requirement that construction contractors must train personnel in the proper balancing of airflow to the bubble ring; and (2) Project Company 1 must submit a performance test and maintenance report to NMFS within 72 hours following the performance test.

Corrections to the attenuation device to meet regulatory requirements must occur prior to use during foundation installation activities. In addition, a full maintenance check (e.g., manually clearing holes) must occur prior to each pile being installed. If Project Company 1 uses a noise mitigation device in addition to a double bubble curtain, similar quality control measures are required.

Project Company 1 is required to use at least a double bubble curtain. Should the research and development phase of newer systems demonstrate effectiveness, as part of adaptive management, Project Company 1 may submit data on the effectiveness of these systems and request approval from NMFS to use them during foundation installation activities in lieu of the double bubble curtain requirement.

Project Company 1 is required to submit an SFV Plan to NMFS for review and approval at least 180 calendar days prior to installing foundations. Project Company 1 is also required to submit interim and final SFV data results to NMFS and make corrections to the noise attenuation systems in the case that any SFV measurements demonstrate noise levels are above those modeled, assuming 10 dB. These frequent and immediate reports allow NMFS to better understand the sound fields to which marine mammals are being exposed and require immediate corrective action should they be misaligned with anticipated noise levels within our analysis.

Noise abatement devices are not required during HRG surveys and cofferdam (sheet pile) installation and removal. Regarding cofferdam sheet pile installation and removal, NAS is not practicable to implement due to the physical nature of linear sheet piles and is a low risk for impacts to marine mammals due to the short work duration and lower noise levels produced during the activities. Regarding HRG surveys, NAS cannot practicably be employed around a moving survey ship, but Project Company 1 is required to make efforts to minimize source levels by using the lowest energy settings on equipment that has the potential to result in harassment of marine mammals (i.e., sparkers, CHIRPs) and turn off equipment when not actively surveying. Overall, minimizing the amount and duration of noise in the ocean from any of the Project's activities through use of all means required (e.g., noise abatement, turning off power) will effect the least practicable adverse impact on marine mammals.

Clearance and Shutdown Zone

NMFS requires the establishment of both clearance and, where technically feasible, shutdown zones during Project activities that have the potential to result in harassment of marine mammals. The purpose of "clearance" of a particular zone is to minimize potential instances of auditory injury and more severe behavioral disturbances by delaying the commencement of an activity if marine mammals are near the activity. The purpose of a shutdown is to prevent a specific acute impact, such as auditory injury or severe behavioral disturbance of sensitive species, by halting the activity.

All relevant clearance and shutdown zones during Project activities would be monitored by NMFS-approved PSOs and/or PAM operators (as applicable and as described in the regulatory text at the end of this rulemaking). At least one PAM operator must review data from at least 24 hours prior to any foundation installation and must actively monitor hydrophones for 60 minutes prior to commencement of these activities. Any sighting or acoustic detection of a North Atlantic right whale triggers a delay to commencing pile driving and shutdown.

Prior to the start of certain specified activities (i.e., foundation installation, temporary cofferdam installation and removal, and HRG surveys), Project Company 1 must ensure designated areas (i.e., clearance zones; see, tables 25, 26, and 27) are clear of marine mammals prior to commencing activities to minimize the potential for and degree of harassment. For all WTG, OSS, and Met Tower foundation installation, PSOs must visually monitor clearance zones for marine mammals for a minimum of 60 minutes, where the zone must be confirmed free of marine mammals at least 30 minutes directly prior to commencing these activities.

Clearance and shutdown zones have been developed in consideration of modeled distances to relevant PTS thresholds with respect to minimizing the potential for take by Level A harassment. All required clearance and shutdown zones for large whales are larger than the largest modeled acoustic range ($R_{95\%}$) distances to thresholds corresponding to Level A harassment (SEL and peak). More specifically, clearance zones represent the largest Level A harassment zone for each species group, plus 20 percent for a minimum of 100 m (328 ft) (whichever is greater). Shutdown zones around the permanent foundations correspond to the modeled results of the greatest

distance to the Level A harassment threshold for each species group, assuming 10 dB of sound attenuation. For any species where the modeling yielded a zero or near-zero range (i.e., delphinids and pilot whale *spp.*), NMFS is conservatively requiring a 100 m (328 ft) zone to ensure adequate protections are in place. For foundation installation, we are also requiring a minimum visibility zone that would extend 1,900 m (6,233.6 ft) from the pile. This value corresponds to the modeled maximum $ER_{95\%}$ distances to the Level A harassment threshold for low-frequency cetaceans, assuming 10 dB of attenuation. We reference the reader to table 25 for the minimum visibility, clearance, and shutdown zone distances for permanent foundation installation.

For cofferdam vibratory pile driving (table 26) and HRG (table 27) surveys, monitoring must be conducted for 30 minutes prior to initiating activities and the clearance zones must be free of marine mammals during that time. HRG surveys also include required vessel separation zones, in alignment with the Vessel Strike Avoidance requirements (refer back to *Vessel Strike Avoidance Measures* section above, as well as table 27 below).

For any other in-water construction heavy machinery activities (e.g., trenching, cable laying, etc.), if a marine mammal is on a path towards or comes within 10 m (32.8 ft) of equipment, Project Company 1 is required to cease operations until the marine mammal has moved more than 10 m on a path away from the activity to avoid direct interaction with equipment.

Once an activity begins, any marine mammal entering their respective shutdown zone would trigger the activity to cease. In the case of pile driving, the shutdown requirement may be waived if it is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or if the lead engineer determines there is pile refusal or pile instability. In situations when shutdown is called for during foundation pile driving but Project Company 1 determines shutdown is not practicable due to aforementioned emergency reasons, reduced hammer energy must be implemented when the lead engineer determines it is practicable. Specifically, pile refusal or pile instability could result in not being able to shut down pile driving immediately. Pile refusal occurs when the pile driving sensors indicate the pile is approaching refusal, and a shut-down would lead to a stuck pile which then poses an imminent risk of injury or loss

of life to an individual, or risk of damage to a vessel that creates risk for individuals. Pile instability occurs when the pile is unstable and unable to stay standing if the piling vessel were to “let go.” During these periods of instability, the lead engineer may determine a shutdown is not feasible because the shutdown combined with impending weather conditions may require the piling vessel to “let go” which then poses an imminent risk of injury or loss of life to an individual, or risk of damage to a vessel that creates risk for individuals. Project Company 1 must

document and report to NMFS all cases where the emergency exemption is taken.

After shutdown, foundation pile driving may be reinitiated once all clearance zones are clear of marine mammals for the minimum species-specific periods, or if required to maintain pile stability, at which time the lowest hammer energy must be used to maintain stability. If pile driving has been shut down due to the presence of a North Atlantic right whale, pile driving must not restart until the North Atlantic right whale has neither been

visually nor acoustically detected for 30 minutes. Upon re-starting pile driving, soft-start protocols must be followed if pile driving has ceased for 30 minutes or longer.

The clearance and shutdown zone sizes vary by species and are shown in tables 25, 26, and 27 for each planned activity. Project Company 1 is allowed to request modification to these zone sizes pending results of SFV (see regulatory text at the end of this rulemaking). Any changes to zone size would be part of adaptive management and would require NMFS’ approval.

TABLE 25—CLEARANCE, SHUTDOWN, AND MINIMUM VISIBILITY ZONES, IN METERS (m), INCLUSIVE OF 10 dB OF SOUND ATTENUATION

Marine mammal species group-specific zone sizes (m)			
Pile size and type	12-m monopiles	15-m monopiles	5-m pin piles
Installation method	Impact pile driving		
North Atlantic right whale—visual clearance/shutdown zone	Sighting at any distance from PSOs on pile-driving or dedicated PSO vessels.		
North Atlantic right whale—PAM clearance/shutdown zone ^a	10,000.		
Other large whales ^{a,b}	Clearance: 2,300; ^c Shutdown: 1,900. ^d		
Delphinids ^a	Clearance: 100; ^c Shutdown: 100. ^d		
Harbor porpoises ^a	Clearance: 1,800; ^c Shutdown: 1,500. ^d		
Seals ^a	Clearance: 400; ^c Shutdown: 350. ^d		
Minimum visibility zone ^e	1,900.		
Distance to Level B harassment threshold (Acoustic ranges (R _{95%}))	Monopiles: 8,300; Pin Piles: 5,500.		

^a The PAM system used during clearance and shutdown must be designed to detect marine mammal vocalizations, maximize baleen whale detections, and must be capable of detecting North Atlantic right whales at 10 km (6.2 mi) for pin piles and monopile installations, respectively. NMFS recognizes that detectability of each species’ vocalizations will vary based on vocalization characteristics (e.g., frequency content, source level), acoustic propagation conditions, and competing noise sources), such that other marine mammal species (e.g., harbor porpoise) may not be detected at 10 km (6.2 mi).

^b This category is inclusive of all non-North Atlantic right whale ESA-listed species (i.e., sperm whales, fin whales, and sei whales) as well as non-ESA listed large whales (i.e., humpback whale and minke whales).

^c The clearance zone is equal to the maximum Level A harassment distance for each species group, assuming 10 dB of attenuation (refer back to table 11), plus 20 percent or a minimum of 100 m (328 ft) or anywhere within the double bubble curtain system, whichever is greater, and rounded up for PSO clarity. Any animal(s) detected visually or acoustically within the clearance zone triggers a delay to commencement of pile driving.

^d The shutdown zone is equal to the maximum Level A harassment distance for each species group, assuming 10 dB of attenuation (refer back to table 11) or a minimum of 100 m (328 ft) or anywhere within the double bubble curtain system, whichever is greater, and rounded up for PSO clarity. Any animal(s) detected visually or acoustically within the shutdown zone triggers a shutdown of pile driving.

^e PSOs must be able to visually monitor the entire minimum visibility zone. The minimum visibility zone is equal to the largest modeled ER_{95%} distances to the Level A harassment threshold for low-frequency cetaceans (i.e., fin whale (sei whale proxy) at 1.90 km), assuming 10 dB of attenuation (refer back to table 11) and rounded up for PSO clarity.

TABLE 26—DISTANCES TO MITIGATION ZONES DURING NEARSHORE CABLE LANDFALL ACTIVITIES [Temporary cofferdams]

Marine mammal species	Specific zone sizes (m)	
	Clearance zone	Shutdown zone
North Atlantic right whale—visual detection	100	100
All other large marine mammals	100	100
Delphinids and pilot whale	50	50
Harbor porpoise	^a 540	^a 540
Seals	60	60

^a Harbor porpoises are unlikely to be present in the nearshore environment.

TABLE 27—DISTANCES TO MITIGATION ZONES DURING HRG SURVEYS

Marine mammal species	Specific zone sizes (m)		
	Clearance zone ^a	Shutdown zone	Vessel separation zone
North Atlantic right whale and unidentifiable large whales	500	500	500
Other ESA-listed large whale species ^b	500	100	500
Other Non-ESA-listed large whale species ^c	500	100	100
Other marine mammals ^d	100	100	50

^a For HRG surveys, Project Company 1 did not propose clearance zones, although they are referenced in the ITA application and in their Protected Species Management and Equipment Specifications Plan (PSMESP). Because of this, NMFS instead proposes Clearance Zones of 500 m (1,640 ft; for North Atlantic right whales), 500 m (1,640 ft; for all other ESA-listed species); and 100 m (328 ft; for all other marine mammals, with exceptions noted for specific bow-riding dolphins). These zones are considered for protection for protected species, given the extensive vessel presence in and around the Project Area.

^b This consists of fin, sei, and sperm whales and was updated to align with the final Biological Opinion.

^c This consists of minke and humpback whales and was updated to align with the final Biological Opinion.

^d This is applicable to all delphinid cetaceans, harbor porpoises, and pinnipeds, with the exception of delphinid(s) from the genera *Delphinus*, *Lagenorhynchus*, *Stenella* or *Tursiops*, as described below.

Soft-Start and Ramp-Up

The use of a soft-start or ramp-up procedure is believed to provide additional protection to marine mammals by warning them or providing them with a chance to leave the area prior to the hammer or HRG equipment operating at full capacity. Soft-start typically involves initiating hammer operation at a reduced energy level (relative to full operating capacity) followed by a waiting period. Project Company 1 must utilize a soft-start protocol for pile driving of foundation piles (monopiles and pin piles). Typically, NMFS requires a soft-start procedure of the applicant performing 4 to 6 strikes per minute at 10 to 20 percent of the maximum hammer energy, for a minimum of 20 minutes. NMFS notes that it is difficult to specify a reduction in energy for any given hammer because of variation across drivers and installation conditions; therefore, soft-start would generally use the lowest percentage of the maximum hammer energy necessary to avoid damage to the hammer and maintain pile stability. Project Company 1 will reduce energy based on consideration of site-specific soil properties and other relevant operational considerations. The final methodology will be developed by Project Company 1 considering final design details, including site-specific soil properties and other considerations, and will be incorporated into the LOA, if issued. Project Company 1, with approval from NMFS, may also modify the soft-start procedures through adaptive management.

HRG survey operators are required to ramp-up sources when the acoustic sources are used unless the equipment operates on a binary on/off switch. The ramp-up would involve starting from the smallest setting to the operating level over a period of approximately 30

minutes. No soft-start or ramp-up is required for nearshore cable landfall activities given the type of activity (*i.e.*, vibratory pile driving for cofferdams).

Where required, soft-start and ramp-up will be required at the beginning of each day’s activity and at any time following a cessation of activity of 30 minutes or longer. Prior to soft-start or ramp-up beginning, the operator must receive confirmation from the PSO that the clearance zone is clear of any marine mammals.

Fishery Monitoring Surveys

While the likelihood of Project Company 1’s fishery monitoring surveys impacting marine mammals is minimal, NMFS requires Project Company 1 to adhere to gear and vessel mitigation measures to reduce potential impacts to the extent practicable. In addition, all crew undertaking the fishery monitoring survey activities are required to receive protected species identification training prior to activities occurring and attend the aforementioned onboarding training. The specific requirements that NMFS has set for the fishery monitoring surveys can be found in the regulatory text at the end of this rulemaking.

Based on our evaluation of the mitigation measures, as well as other measures considered, NMFS has determined that these measures will provide the means of affecting 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.

Monitoring and Reporting

As noted in the Changes From the Proposed to Final Rule section, we have added, modified, or clarified a number of monitoring and reporting measures since the proposed rule. These changes are described in detail in the sections

below and, otherwise, the marine mammal monitoring and reporting requirements have not changed since the proposed rule.

In order to promulgate a rulemaking for an activity, section 101(a)(5)(A) 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 ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or

cumulative impacts from multiple stressors;

- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and/or
- Mitigation and monitoring effectiveness.

Separately, monitoring is also regularly used to support mitigation implementation, which is referred to as mitigation monitoring, and monitoring plans typically include measures that both support mitigation implementation and increase our understanding of the impacts of the activity on marine mammals.

During the planned activities, visual monitoring by NMFS-approved PSOs would be conducted before, during, and after all impact pile driving, vibratory pile driving, and HRG surveys. PAM would also be conducted during foundation pile driving. Visual observations and acoustic detections would be used to support the activity-specific mitigation measures (*e.g.*, clearance zones). To increase understanding of the impacts of the activity on marine mammals, PSOs must record all incidents of marine mammal occurrence at any distance from the foundation piling locations and near the HRG acoustic sources. PSOs would document all behaviors and behavioral changes, in concert with distance from an acoustic source. The required monitoring is described below, beginning with PSO measures that are applicable to all the aforementioned activities, followed by activity-specific monitoring requirements.

Protected Species Observer (PSO) and Passive Acoustic Monitoring (PAM) Operator Requirements

Project Company 1 is required to employ NMFS-approved PSOs and PAM operators. PSOs are trained professionals who are tasked with visual monitoring for marine mammals during pile driving and HRG surveys. The primary purpose of a PSO is to carry out the monitoring, collect data, and, when appropriate, call for the implementation of mitigation measures. In addition to visual observations, NMFS requires Project Company 1 to conduct PAM by PAM operators during foundation pile driving and vessel transit. The inclusion of PAM, which would be conducted by NMFS-approved PAM operators, following a standardized measurement,

processing methods, reporting metrics, and metadata standards for offshore wind, alongside visual data collection is valuable to provide the most accurate record of species presence as possible and, together, these two monitoring methods are well understood to provide best results when combined (*e.g.*, Barlow and Taylor, 2005; Clark *et al.*, 2010; Gerrodette *et al.*, 2011; Van Parijs *et al.*, 2021). Acoustic monitoring (in addition to visual monitoring) increases the likelihood of detecting marine mammals within the shutdown and clearance zones of Project activities, which when applied in combination with required shutdowns helps to further reduce the risk of marine mammals being exposed to sound levels that could otherwise result in acoustic injury or more intense behavioral harassment.

The exact configuration and number of PAM systems depends on the size of the zone(s) being monitored, the amount of noise expected in the area, and the characteristics of the signals being monitored. More closely spaced hydrophones would allow for more directionality, and perhaps, range to the vocalizing marine mammals; however, this approach would add additional costs and greater levels of complexity to the Project. Larger baleen cetacean species (*i.e.*, mysticetes), which produce loud and lower-frequency vocalizations, may be able to be heard with fewer hydrophones spaced at greater distances. However, smaller cetaceans (*e.g.*, mid-frequency delphinids (odontocetes)) may necessitate more hydrophones and to be spaced closer together given the shorter range of the shorter, mid-frequency acoustic signals (*e.g.*, whistles and echolocation clicks). As there are no “perfect fit” single-optimal-array configurations, these setups would need to be considered on a case-by-case basis.

NMFS does not formally administer any PSO or PAM operator training program or endorse specific providers, but will approve PSOs and PAM operators that have successfully completed courses that meet the curriculum and trainer requirements referenced below and further specified in the regulatory text at the end of this rulemaking.

NMFS will provide PSO and PAM operator approvals in the context of the need to ensure that PSOs and PAM operators have the necessary training and/or experience to carry out their duties competently. In order for PSOs and PAM operators to be approved, NMFS must review and approve PSO and PAM operator resumes indicating successful completion of an acceptable

training course. PSOs and PAM operators must have previous experience observing marine mammals and must have the ability to work with all required and relevant software and equipment. NMFS may approve PSOs and PAM operators as conditional or unconditional. A conditional approval may be given to one who is trained but has not yet attained the requisite experience. An unconditional approval is given to one who is trained and has attained the necessary experience. The specific requirements for conditional and unconditional approval can be found in the regulatory text at the end of this rulemaking.

Conditionally-approved PSOs and PAM operators would be paired with an unconditionally-approved PSO (or PAM operator, as appropriate) to ensure that the quality of marine mammal observations and data recording is kept consistent. Additionally, activities requiring PSO and/or PAM operator monitoring must have a lead on duty. The visual PSO field team, in conjunction with the PAM team (*i.e.*, marine mammal monitoring team), would have a lead member (designated as the “Lead PSO”) who would be required to meet the unconditional approval standard.

Although PSOs and PAM operators must be approved by NMFS, third-party observer providers and/or companies seeking PSO and PAM operator staffing should expect that those having satisfactorily completed acceptable training and with the requisite experience (if required) will be quickly approved. Project Company 1 is required to request PSO and PAM operator approvals 60 business days prior to those personnel commencing work. An initial list of previously approved PSO and PAM operators must be submitted by Project Company 1 at least 30 business days prior to the start of the Project. Should Project Company 1 require additional PSOs or PAM operators throughout the Project, Project Company 1 must submit a subsequent list of pre-approved PSOs and PAM operators to NMFS at least 15 business days prior to planned use of that PSO or PAM operator. A PSO may be trained and/or experienced as both a PSO and PAM operator and may perform either duty, pursuant to scheduling requirements (and vice versa).

A minimum number of PSOs would be required to actively observe for the presence of marine mammals during certain Project activities with more PSOs required as the mitigation zone sizes increase. A minimum number of PAM operators would be required to actively monitor for the presence of

marine mammals during foundation installation. The types of equipment required (e.g., big eyes on the pile driving vessel) are also designed to increase marine mammal detection capabilities. Specifics on these types of requirements can be found in the regulations at the end of this rulemaking. In summary, at least three PSOs and one PAM operator per acoustic data stream (equivalent to the number of acoustic buoys) must be on-duty and actively monitoring per platform during foundation installation; at least two PSOs must be on duty during cable landfall construction vibratory pile installation and removal (temporary cofferdams); at least one PSO must be on-duty during HRG surveys conducted during daylight hours; and at least two PSOs must be on-duty during HRG surveys conducted during nighttime.

In addition to monitoring duties, PSOs and PAM operators are responsible for data collection. The data collected by PSO and PAM operators and subsequent analysis provide the necessary information to inform an estimate of the amount of take that occurred during the Project, better understand the impacts of the Project on marine mammals, address the effectiveness of monitoring and mitigation measures, and to adaptively manage activities and mitigation in the future. Data reported includes information on marine mammal sightings, activity occurring at time of sighting, monitoring conditions, and if mitigative actions were taken. Specific data collection requirements are contained within the regulations at the end of this rulemaking.

Project Company 1 is required to submit a Pile Driving Marine Mammal Monitoring Plan and a PAM Plan to NMFS for review and approval at least 180 calendar days in advance of foundation installation activities. The Plan must include details regarding PSO and PAM protocols and equipment proposed for use. More specifically, the PAM Plan must include a description of all proposed PAM equipment, address how the proposed PAM must follow standardized measurements, processing methods, reporting metrics, and metadata standards for offshore wind as described in *NOAA and BOEM Minimum Recommendations for Use of Passive Acoustic Listening Systems in Offshore Wind Energy Development Monitoring and Mitigation Programs* (Van Parijs *et al.*, 2021). NMFS must approve the Plan prior to foundation installation activities commencing. Specific details on NMFS' PSO or PAM operator qualifications and

requirements can be found in Part 217—Regulations Governing The Taking And Importing Of Marine Mammals at the end of this rulemaking.

Additional information can be found in Project Company 1's Protected Species Management and Equipment Specifications Plan (PSMESP; appendix E) found on NMFS' website at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>.

Sound Field Verification (SFV)

Project Company 1 must conduct thorough SFV measurements for all foundation pile-driving activities associated with the installation of, at minimum, the first three monopile foundations, and for the first three full three jacket foundations used for OSS (inclusive of all pin piles for each OSS foundation). If monopiles are instead installed for OSSs, the first three monopiles for OSSs must have SFV conducted. SFV measurements must continue until at least three monopiles for WTGs and three entire jacket foundations (inclusive of all pin piles for a given OSS foundation), or three monopiles for OSS foundations (if these are used instead) demonstrate distances to thresholds are at or below those modeled, assuming 10 dB of attenuation. Subsequent SFV measurements are also required should pile specifications be different from what was analyzed here (e.g., 12-m (39.37-ft) versus 15-m (49.21-ft) diameter monopiles, different sized jacket pin piles (5-m (16.4-ft)), *etc.*), or if additional piles are driven that are anticipated to produce longer distances to harassment isopleths than those previously measured (e.g., higher hammer energy, greater number of strikes, *etc.*). These recordings must be continuous through the duration of all pile driving of each foundation.

Additionally, in alignment with the final Biological Opinion, Project Company 1 is required to undertake abbreviated SFV monitoring, which consists of a single acoustic recorder and a bottom and midwater hydrophone which are placed at an appropriate distance from the pile. This must be undertaken for all pile driven foundation installation (monopile and jacket foundations) for which thorough SFV is not carried out. The abbreviated SFV is intended to provide a means of monitoring attenuated sound produced during pile driving and to provide an indication of whether sound is louder than anticipated, which can allow for adjustments to be made to noise attenuation measures or pile driving

operations. If results of the abbreviated SFV monitoring indicate that distances to the identified Level A harassment and Level B harassment thresholds for marine mammals may have been exceeded during the pile driving event, Project Company 1 is required to notify NMFS Office of Protected Resources and NMFS GARFO as soon as possible after receiving such results. Results of abbreviated SFV monitoring must be included in the weekly pile driving reports. If exceedance occurs, the weekly report must include an explanation of suspected or identified factors that contributed to the potential exceedance and a description of corrective actions that were taken, or planned to be taken, to avoid potential exceedance on subsequent piles, or an explanation if no such actions are available. NMFS may require additional actions be undertaken, including but not limited to: adjustments or additions to the noise attenuation system or pile driving operations, and/or additional thorough SFV monitoring.

The measurements and reporting associated with SFV (thorough/complete and abbreviated) can be found in the regulatory text at the end of this rulemaking. The requirements are extensive to ensure monitoring is conducted appropriately and the reporting frequency is such that Project Company 1 is required to make adjustments quickly (e.g., ensure bubble curtain hose maintenance, check bubble curtain air pressure supply, add additional sound attenuation, *etc.*) to ensure marine mammals are not experiencing noise levels above those considered in this analysis. For recommended SFV protocols for impact pile driving, please consult the ISO 18406 *Underwater acoustics—Measurement of radiated underwater sound from percussive pile driving* (International Organization for Standardization, 2017).

Reporting

Prior to any construction activities occurring, Project Company 1 would provide a report to NMFS Office of Protected Resources that demonstrates that all Project Company 1 personnel, including the vessel crews, vessel captains, PSOs, and PAM operators have completed all required trainings.

NMFS would require standardized and frequent reporting from Project Company 1 during the life of the regulations and LOA. All data collected relating to the Project would be recorded using industry-standard software (e.g., *Mysticetus* or a similar software) installed on field laptops and/or tablets. Project Company 1 is required

to submit weekly, monthly, annual, and situational reports. The specifics of what we require to be reported can be found in the regulatory text at the end of this final rule.

Weekly Report—During foundation installation activities, Project Company 1 would be required to compile and submit weekly marine mammal monitoring reports for foundation installation pile driving to NMFS Office of Protected Resources that document the daily start and stop of all pile-driving activities, the start and stop of associated observation periods by PSOs, details on the deployment of PSOs, a record of all detections of marine mammals (acoustic and visual), any mitigation actions (or if mitigation actions could not be taken, provide reasons why), and details on the NAS(s) (e.g., system type, distance deployed from the pile, bubble rate, etc.). The weekly reports are also required to identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is complete, weekly reports would no longer be required.

Monthly Report—Project Company 1 is required to compile and submit monthly reports to NMFS Office of Protected Resources that include a summary of all information in the weekly reports, including Project activities carried out in the previous month, vessel transits (number, type of vessel, and route), number of piles installed, all detections of marine mammals, and any mitigative actions taken. The monthly report would also identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is complete, monthly reports would no longer be required.

Annual Reporting—Project Company 1 is required to submit an annual marine mammal monitoring (both PSO and PAM) report to NMFS Office of Protected Resources, describing, in detail, all of the information required in the monitoring section above.

Final 5-Year Reporting—Project Company 1 must submit its draft 5-year report(s) to NMFS Office of Protected Resources on all visual and acoustic monitoring conducted under the LOA within 90 calendar days of the completion of activities occurring under the LOA. A final 5-year report must be prepared and submitted within 60 calendar days following receipt of any NMFS comments on the draft report. Information contained within this report is described at the beginning of this section.

Situational Reporting—Specific situations encountered during the

development of the Project require immediate reporting. For instance, if a North Atlantic right whale is observed at any time by PSOs or Project personnel, the sighting must be immediately (if not feasible, as soon as possible and no longer than 24 hours after the sighting) reported to NMFS Office of Protected Resources. If a North Atlantic right whale is acoustically detected at any time via a Project-related PAM system, the detection must be reported as soon as possible and no longer than 24 hours after the detection to NMFS via the 24-hour North Atlantic right whale Detection Template (see <https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates>). Calling the hotline is not necessary when reporting PAM detections via the template.

If a sighting of a stranded, entangled, injured, or dead marine mammal occurs, the sighting would be reported to NMFS Office of Protected Resources, the NMFS Greater Atlantic Stranding Coordinator for the New England/Mid-Atlantic area (866-755-6622), and the U.S. Coast Guard within 24 hours. If the injury or death was caused by a Project activity, Project Company 1 must immediately cease all activities until NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. Project Company 1 may not resume their activities until notified by NMFS Office of Protected Resources.

In the event of a vessel strike of a marine mammal by any vessel associated with the Project, Project Company 1 must immediately report the strike incident. If the strike occurs in the Greater Atlantic Region (Maine to Virginia), Project Company 1 must call the NMFS Greater Atlantic Stranding Hotline. Separately, Project Company 1 must also and immediately report the incident to NMFS Office of Protected Resources and NMFS GARFO. Project Company 1 must immediately cease all on-water activities until NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. Project Company 1 may not

resume their activities until notified by NMFS.

In the event of any lost gear associated with the fishery surveys, Project Company 1 must report to NMFS GARFO as soon as possible or within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.

The specifics of what NMFS Office of Protected Resources requires to be reported is listed at the end of this rulemaking in the regulatory text.

Sound Field Verification—Project Company 1 is required to submit interim SFV reports after each foundation installation as soon as possible but within 48 hours. A final SFV report for all foundation installations would be required within 90 calendar days following completion of acoustic monitoring.

Adaptive Management

The regulations governing the take of marine mammals incidental to Project Company 1's construction activities contain an adaptive management component. Our understanding of the effects of offshore wind construction activities (e.g., acoustic stressors) on marine mammals continues to evolve (quickly, given the pace of offshore wind development), which makes the inclusion of an adaptive management component both valuable and necessary within the context of 5-year regulations.

The monitoring and reporting requirements in this final rule provide NMFS with information that helps us to better understand the impacts of the Project's activities on marine mammals and informs our consideration of whether any changes to mitigation and monitoring are appropriate.

The use of adaptive management allows NMFS to consider new information and modify mitigation, monitoring, or reporting requirements, as appropriate, with input from Project Company 1 regarding practicability, if such modifications will have a reasonable likelihood of more effectively accomplishing the goal of the measures. The following are some of the possible sources of new information to be considered through the adaptive management process: (1) results from monitoring reports, including the weekly, monthly, situational, and annual reports required; (2) results from marine mammal and sound research; and (3) any information which reveals that marine mammals may have been taken in a manner, extent, or number not allowed authorized by these regulations or subsequent LOA,

respectively. During the course of the rule, Project Company 1 (and other LOA Holders conducting offshore wind development activities) are required to participate in one or more adaptive management meetings convened by NMFS and/or BOEM, in which the above information will be summarized and discussed in the context of potential changes to the mitigation or monitoring measures.

As described previously, the analysis herein has used the best available science to assess the impacts of the Project's activities and to identify appropriate mitigation and monitoring measures, while acknowledging the uncertainty inherent in certain input values (*e.g.*, source levels and spectra) and the environmental variability present in real-life physical and biological systems. As other companies using similar methods to install wind turbines on the U.S. East Coast continue to report their monitoring results, we continue to learn more about the nature of the environmental variability likely to be encountered in offshore wind construction, as well as the ways in which it may be necessary to vary equipment or operational parameters to address real-life conditions encountered during construction. Accordingly, the adaptive management provisions also include the ability to modify the LOA at the request of the company and with public notice and comment, where appropriate, provided certain findings are made, and we emphasize the importance of discussing and requesting any such modifications as early as possible and prior to the modification being needed.

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" by mortality, serious injury, Level A harassment and Level B harassment, we consider other factors, such as the likely nature of any behavioral responses (*e.g.*, intensity, duration), the context of any such responses (*e.g.*, critical

reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of 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 environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

In the Estimated Take section, we discuss the estimated maximum number of takes by Level A harassment and Level B harassment that are reasonably expected to occur incidental to Project Company 1's specified activities based on the methods described. The impact that any given take would have is dependent on many case-specific factors that need to be considered in the negligible impact analysis (*e.g.*, the context of behavioral exposures such as duration or intensity of a disturbance, the health of impacted animals, the status of a species that incurs fitness-level impacts to individuals, *etc.*). In this final rule, we evaluate the likely impacts of the enumerated harassment takes that are allowed in the context of the specific circumstances surrounding these predicted takes. We also collectively evaluate this information, as well as other more taxa-specific information and mitigation measure effectiveness, in group-specific discussions that support our negligible impact conclusions for each stock. As described above, no serious injury or mortality is expected or allowed for any species or stock.

The Description of the Specified Activities section of this preamble describes Project Company 1's specified activities that may result in take of marine mammals and an estimated schedule for conducting those activities. Project Company 1 has provided a realistic construction schedule (*e.g.*, Project Company 1's schedule reflects the maximum number of piles they anticipate to be able to drive each month in which pile driving is able to occur), although we recognize schedules may shift for a variety of reasons (*e.g.*, weather or supply delays). However, the total number of takes would not exceed the 5-year totals and maximum annual allowable totals indicated in tables 23 and 24, respectively.

We base our analysis and negligible impact determination on the maximum

number of takes that are allowed annually and across the effective period of these regulations and extensive qualitative consideration of other contextual factors that influence the degree of impact of the takes on the affected individuals and the number and context of the individuals affected. As stated before, the number of takes, both annual and 5-year total take, that are reasonably expected to occur, are only a part of the analysis.

To avoid repetition, we provide some general analysis in this Negligible Impact Analysis and Determination section that applies to all the species listed in table 2, given that some of the anticipated effects of Project Company 1's construction activities on marine mammals are expected to be relatively similar in nature. Then, we subdivide into more detailed discussions for mysticetes, odontocetes, and pinnipeds, which have broad life-history traits that support an overarching discussion of some factors considered within the analysis for those groups (*e.g.*, habitat-use patterns, high-level differences in feeding strategies).

Last, we provide a negligible impact determination for each species or stock, providing species or stock-specific information or analysis, where appropriate (*e.g.*, North Atlantic right whales given their population status). Organizing our analysis by grouping species or stocks that share common traits or that would respond similarly to effects of Project Company 1's activities, and then providing species- or stock-specific information, allows us to avoid duplication while ensuring that we have analyzed the effects of the specified activities on each affected species or stock. It is important to note that in the group or species sections, we base our negligible impact analysis on the maximum allowable annual take and the 5-year total allowable take; however, the majority of the impacts are associated with WTG, OSS, and Met Tower foundation installation, which is scheduled to occur largely within the first 3 years (2025, 2026, and 2027; see table 1) of the effective period of these regulations. The estimated take in the other years is expected to be notably less, which is reflected in the total take that would be allowable under the rule (see tables 22, 23, and 24).

As described previously, no serious injury or mortality is anticipated or allowed in this rule. Any Level A harassment allowed would be in the form of auditory injury (*i.e.*, PTS). The number of takes by harassment Project Company 1 has requested, and NMFS may authorize, in a LOA is based on exposure models that consider the

outputs of acoustic source and propagation models. Several conservative parameters and assumptions are ingrained into the models, such as assuming forcing functions that consider direct contact with piles (*i.e.*, no cushion allowances), and no consideration to the benefits of mitigation measures (other than 10 dB sound attenuation and seasonal restrictions) or an avoidance response. The number of takes requested and may be authorized in a LOA also reflects careful consideration of other data (*e.g.*, group size data, PSO data). For all species, the number of takes allowed represents the maximum amount of Level A harassment and Level B harassment that is reasonably expected to occur.

Behavioral Disturbance

In general, NMFS anticipates that impacts on an individual that has been harassed are likely to be more intense when exposed to higher received levels and for a longer duration (though this is in no way a strictly linear relationship for behavioral effects across species, individuals, or circumstances) and less severe impacts result when exposed to lower received levels and for a brief duration. However, there is also growing evidence of the importance of contextual factors such as distance from a source in predicting marine mammal behavioral response to sound—*i.e.*, sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter and Doukara, 2012; Falcone *et al.*, 2017). As described in the Potential Effects to Marine Mammals and their Habitat section of the proposed rule (88 FR 65430, September 22, 2023), the intensity and duration of any impact resulting from exposure to Project Company 1's activities is dependent upon a number of contextual factors including, but not limited to, sound source frequencies, whether the sound source is moving towards the animal, hearing ranges of marine mammals, behavioral state at time of exposure, status of individual exposed (*e.g.*, reproductive status, age class, health) and an individual's experience with similar sound sources. Southall *et al.* (2021), Ellison *et al.* (2012), and Moore and Barlow (2013), among others, emphasize the importance of context (*e.g.*, behavioral state of the animals, distance from the sound source) in evaluating behavioral responses of marine mammals to acoustic sources. Harassment of marine mammals may result in behavioral modifications (*e.g.*, avoidance, temporary cessation of

foraging or communicating, changes in respiration or group dynamics, masking) or may result in auditory impacts such as hearing loss. In addition, some of the lower level physiological stress responses (*e.g.*, change in respiration, change in heart rate) discussed previously would likely co-occur with the behavioral modifications, although these physiological responses are more difficult to detect and fewer data exist relating these responses to specific received levels of sound. Takes by Level B harassment, then, may have a stress-related physiological component as well; however, we would not expect Project Company 1's activities to produce conditions of long-term and continuous exposure to noise leading to long-term physiological stress responses in marine mammals that could affect reproduction or survival.

In the range of behavioral effects that might be expected to be part of a response that qualifies as an instance of Level B harassment by behavioral disturbance (which by nature of the way it is modeled/counted, occurs within 1 day), the less severe end might include exposure to comparatively lower levels of a sound, at a greater distance from the animal, for a few or several minutes. A less severe exposure of this nature could result in a behavioral response such as avoiding an area that an animal would otherwise have chosen to move through or feed in for some amount of time or breaking off one or a few feeding bouts. More severe effects could occur if an animal gets close enough to the source to receive a comparatively higher level, is exposed continuously to one source for a longer time or is exposed intermittently to different sources throughout a day. Such exposure might result in an animal having a more severe flight response and leaving a larger area for a day or more or potentially losing feeding opportunities for a day. Such severe behavioral effects are expected to occur infrequently due to extensive mitigation and monitoring measures included in this rule.

Many species perform vital functions, such as feeding, resting, traveling, and socializing on a diel cycle (*i.e.*, 24-hour cycle). Behavioral reactions to noise exposure, when taking place in a biologically important context, such as disruption of critical life functions, displacement, or avoidance of important habitat, are more likely to be significant if they last more than 1 day or recur on subsequent days (Southall *et al.*, 2007) due to diel and lunar patterns in diving and foraging behaviors observed in many cetaceans (Baird *et al.*, 2008; Barlow *et al.*, 2020; Henderson *et al.*, 2016; Schorr *et al.*, 2014). It is important

to note the water depths in the Project Area are relatively shallow (*i.e.*, ranging between 19 to 37 m (62 to 121 ft) in the Lease Areas, 0 to 22 m (0 to 72 ft) in the Atlantic City export cable route, and 0 to 30 m (0 to 98 ft) in the Monmouth export cable route) and deep diving species, such as sperm whales, are not expected to be engaging in deep foraging dives when exposed to noise above NMFS harassment thresholds during the specified activities. Therefore, we do not anticipate impacts to deep foraging behavior to be impacted by the specified activities.

It is also important to note that the estimated number of takes does not necessarily equate to the number of individual animals Project Company 1 expects to harass (which is lower) but rather to the instances of take (*i.e.*, exposures above the Level B harassment thresholds) that may occur. These instances may represent either brief exposures (*e.g.*, HRG surveys), or, in some cases, longer durations of exposure within a day (*e.g.*, pile driving). Some members of a species or stock may experience one exposure as they move through an area while other individuals of a species may experience recurring instances of take over multiple concurrent or non-concurrent days throughout the year, in which case the number of individuals taken is smaller than the total estimated takes. For species that are more likely to be migrating through the area (*e.g.*, North Atlantic right whales) and/or for which only a comparatively smaller number of takes are predicted (*e.g.*, some of the mysticetes), it is more likely that each take represents a different individual whereas for non-migrating species (*e.g.*, delphinids) with larger amounts of predicted take, we expect that the total anticipated takes represent exposures of a smaller number of individuals of which some would be taken across multiple days.

For Project Company 1, impact pile driving of foundation piles is most likely to result in a higher magnitude and severity of behavioral disturbance than other activities (*i.e.*, vibratory pile driving, HRG surveys). Impact pile driving has higher source levels and longer durations (on an annual basis) than vibratory pile driving and HRG surveys. HRG survey equipment also produces much higher frequencies than pile driving, resulting in minimal sound propagation and associated exposure. While impact pile driving for foundation installation is anticipated to be most impactful for these reasons, impacts are minimized, to the extent practicable, through implementation of mitigation measures, including use of a

sound attenuation system, soft-starts, the implementation of clearance zones that would facilitate a delay to pile-driving commencement, and implementation of shutdown zones. For example, given sufficient notice through the use of soft-start, marine mammals are expected to move away from a sound source that is disturbing prior to becoming exposed to very loud noise levels. Moreover, impact pile driving would not be occurring all day or every day during the pile driving season. Furthermore, comprehensive monitoring efforts, completed through both visual observations and PAM using trained and qualified observers and monitors, would provide sufficient awareness of any animals within the relevant pile driving zones. The requirement to couple visual monitoring and PAM before and during all foundation installation will increase the overall capability to detect marine mammals compared to one method alone (e.g., Van Parijs *et al.*, 2021).

Occasional, milder behavioral reactions are unlikely to cause long-term consequences for individual animals or populations, and even if some smaller subset of the takes are in the form of a longer (several hours or a day) and more severe response, if they are not expected to be repeated over numerous or sequential days, impacts to individual fitness are not anticipated. Also, the effect of disturbance is strongly influenced by whether it overlaps with biologically important habitats when individuals are present—avoiding biologically important habitats will provide opportunities to compensate for reduced or lost foraging (Keen *et al.*, 2021). Nearly all studies and experts agree that infrequent exposures of a single day or less are unlikely to impact an individual's overall energy budget (Farmer *et al.*, 2018; Harris *et al.*, 2017; King *et al.*, 2015; National Academy of Science, 2017; New *et al.*, 2014; Southall *et al.*, 2007; Villegas-Amtmann *et al.*, 2015).

Temporary Threshold Shift (TTS)

TTS is one form of Level B harassment that marine mammals may incur through exposure to Project Company 1's activities and, as described earlier, the allowed takes by Level B harassment may represent takes in the form of behavioral disturbance, TTS, or both. As discussed in the Potential Effects of Specified Activities on Marine Mammals and their Habitat section of the proposed rule (88 FR 65430, September 22, 2023), in general, TTS can last from a few minutes to days, be of varying degree, and occur across different frequency bandwidths, all of

which determine the severity of the impacts on the affected individual, which can range from minor to more severe. Impact and vibratory pile driving generate sounds in the lower frequency ranges (with most of the energy below 1–2 kHz but with a small amount of energy ranging up to 20 kHz); therefore, in general and all else being equal, we anticipate the potential for TTS is higher in low-frequency cetaceans (*i.e.*, mysticetes) than other marine mammal hearing groups and is more likely to occur in frequency bands in which they communicate. For the Project, vibratory pile driving is only expected to occur related to the nearshore cable landfall activities at both the Atlantic City and Monmouth cable landfall sites. Given the proximity to shore and the shallower waters, it is unlikely that many large whales consisting of low-frequency specialists would spend a significant portion of time in this nearshore environment. Furthermore, although the potential for TTS may be higher for low frequency cetaceans (mysticetes) than other marine mammal hearing groups, table 18 demonstrates that the maximum distance to the Level A harassment threshold from nearshore cable landfall activities is 65 m (213.3 ft), which is comprehensively covered by the distances required for both clearance and shutdown of this activity (100 m (328 ft)), per table 26. Additionally, though the frequency range of TTS that marine mammals might sustain would overlap with some of the frequency ranges of their vocalizations, the frequency range of TTS from Project Company 1's pile driving activities would not typically span the entire frequency range of one vocalization type, much less span all types of vocalizations or other critical auditory cues for any given species. The required mitigation measures further reduce the potential for TTS for all species.

Generally, both the degree of TTS and the duration of TTS would be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher or the duration is longer). However, in general, an animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL, which would be unlikely considering the required mitigation and the nominal speed of the receiving animal relative to the stationary sources such as impact pile driving. The recovery time of TTS is also of importance when considering the potential impacts from TTS. In TTS

laboratory studies (as discussed in the Potential Effects of the Specified Activities on Marine Mammals and their Habitat section of the proposed rule (88 FR 65430, September 22, 2023)), some using exposures of almost an hour in duration or up to 217 SEL, almost all individuals recovered within 1 day (or less, often in minutes) and while the pile-driving activities may last for hours a day, it is unlikely that most marine mammals would stay in the close vicinity of the source long enough to incur more severe TTS. The use of soft-start further reduces the potential for TTS by allowing the animal time to move away from the source prior to engaging in higher or full power levels. Overall, given the small number of times that any individual might incur TTS, the low degree of TTS and the short anticipated duration, and the unlikely scenario that any TTS overlapped the entirety of a critical hearing range, it is unlikely that TTS of the nature expected to result from the Project's activities would result in behavioral changes or other impacts that would impact any individual's (of any hearing sensitivity) reproduction or survival.

Permanent Threshold Shift (PTS)

NMFS is authorizing a very limited number (*i.e.*, single digits annually) of takes by PTS to some marine mammal individuals. The numbers of allowed annual takes by Level A harassment are relatively low for all marine mammal stocks and species (see table 23). The only activity incidental to which we anticipate PTS may occur is impact pile driving, which produces sounds that are both impulsive and primarily concentrated in the lower frequency ranges (*i.e.*, below 1 kHz) (David, 2006; Krumpel *et al.*, 2021).

There are no PTS data on cetaceans and only one instance of PTS being induced in older harbor seals (Reichmuth *et al.*, 2019). However, available TTS data (of mid-frequency hearing specialists exposed to mid- or high-frequency sounds (Southall *et al.*, 2007; NMFS, 2018; Southall *et al.*, 2019)) suggest that most threshold shifts occur in the frequency range of the source up to one octave higher than the source. We anticipate a similar result for PTS. Further, no more than a small degree of PTS is expected to be associated with any of the incurred Level A harassment, given it is unlikely that animals would stay in the close vicinity of a source for a duration long enough to produce more than a small degree of PTS.

Any PTS incurred from these activities would consist of minor

degradation of hearing capabilities occurring predominantly at frequencies one-half to one octave above the frequency of the energy produced by pile driving (*i.e.*, the low-frequency region below 2 kHz) (Cody and Johnstone, 1981; McFadden, 1986; Finneran, 2015), which is not severe hearing impairment. If hearing impairment occurs from impact pile driving, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics. Given sufficient notice through use of soft-start prior to implementation of full hammer energy during impact pile driving, marine mammals are expected to move away from a sound source that is disturbing prior to it resulting in severe PTS. For these reasons, any PTS incurred as a result of exposure to these activities is not expected to impact the reproduction or survival of any individuals.

Auditory Masking or Communication Implications

The ultimate potential impacts of masking on an individual are similar to those discussed for TTS (*e.g.*, decreased ability to communicate, forage effectively, or detect predators), but an important difference is that masking only occurs during the time of the signal, versus TTS, which continues beyond the duration of the signal. Also, masking can result from the sum of exposure to multiple signals, none of which might individually cause TTS. Fundamentally, masking is referred to as a chronic effect because one of the key potential harmful components of masking is its duration—the fact that an animal would have reduced ability to hear or interpret critical cues becomes much more likely to cause a problem the longer it is occurring. Inherent in the concept of masking is the fact that the potential for the effect is only present during the times that the animal and the source are in close enough proximity for the effect to occur and further, this time period would need to coincide with a time that the animal was utilizing sounds at the masked frequency.

As our analysis for this Project has indicated, we expect that impact pile driving foundations have the greatest potential to mask marine mammal signals, and this pile driving may occur for several hours per day, for multiple days from May 1st to December 31st most likely in Years 2 and 3. Masking is fundamentally more of a concern at lower frequencies (which are pile-driving dominant frequencies), because low frequency signals propagate

significantly further than higher frequencies and because they are more likely to overlap both the narrower low frequency calls of mysticetes, as well as many non-communication cues related to fish and invertebrate prey, and geologic sounds that inform navigation. However, as described in the Potential Effects of the Specified Activities on Marine Mammals and their Habitat section of the proposed rule, the area in which masking would occur for all marine mammal species and stocks (*e.g.*, predominantly in the vicinity of the foundation pile being driven) is small relative to the extent of habitat used by each species and stock. In summary, the nature of Project Company 1's activities, paired with habitat use patterns by marine mammals, does not support a finding of high likelihood that the level of masking that could occur would have the potential to affect reproductive success or survival.

Impacts on Habitat and Prey

Construction activities may result in fish and invertebrate mortality or injury very close to the source, and all of Project Company 1's activities may cause some fish to leave the area of disturbance. It is anticipated that any mortality or injury would be limited to a very small subset of available prey and the implementation of mitigation measures such as the use of a dual noise attenuation system (*i.e.*, a double bubble curtain) during impact pile driving would further limit the degree of impact. Behavioral changes in prey in response to construction activities could temporarily impact marine mammals' foraging opportunities in a limited portion of the foraging range; however, due to the relatively small area of the habitat that may be affected at any given time (*e.g.*, around a pile being driven), the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Cable presence is not anticipated to impact marine mammal habitat as these would be buried, and any electromagnetic fields emanating from the cables are not anticipated to result in consequences that would impact marine mammals prey to the extent they would be unavailable for consumption.

The physical presence of permanent foundations (*i.e.*, WTG, OSS, and Met Tower) and associated scour protection within the Lease Areas would remain within marine mammal habitat for approximately 35 years. The Project would consist of up to 211 permanent foundations (up to 200 WTGs, 10 small OSSs, and 1 Met Tower) in the Lease Areas (although up to 205 permanent foundations (up to 200 WTGs, 4 large

OSSs, and 1 Met Tower) were analyzed in this final rulemaking for take, given the maximum amount of pile driving that could occur), which will gradually become operational as foundations and turbines are installed. The submerged parts of these structures act as artificial reefs, providing new habitats and restructuring local ecology, likely affecting some prey resources that could benefit many species, including some marine mammals. It is likely some or all of Project 1 will be operational before construction of Project 2 begins. Wind turbine presence and/or operations is, in general, likely to result in oceanographic effects in the marine environment, and may alter aggregations and distribution of marine mammal zooplankton prey and other species through changing the strength of tidal currents and associated fronts, changes in stratification, primary production, the degree of mixing, and stratification in the water column (Schultze *et al.*, 2020; Chen *et al.*, 2021; Johnson *et al.*, 2021; Christiansen *et al.*, 2022; Dorrell *et al.*, 2022). There is significant uncertainty regarding the extent to and rate at which changes may occur, how potential changes might impact various marine mammal prey species (*e.g.*, fish, copepods), and how or if impacts to prey species might result in impacts to marine mammal foraging that may result in fitness consequences. Importantly, the Project Area is not a primary or unique foraging ground for any marine mammal species.

The oceanographic and atmospheric effects from the presence and operation of wind turbines are possible at a range of temporal and spatial scales, based on regional and local oceanographic and atmospheric conditions as well as the size and locations of wind farms. In general, the disturbance of wind speed and wind wakes from operational wind farms can cause oceanic responses such as upwelling, downwelling, and desertification (van Berkel *et al.*, 2020; Dorrell *et al.*, 2022; Floeter *et al.*, 2022). Other physical impacts include thermal stratification and increases in turbulence, eddies, sediment erosion, and turbidity. These changes may be beneficial (*e.g.*, upwelling may increase primary production) or adverse. The Atlantic Shores South Biological Opinion provided an evaluation of the impacts to ESA-listed marine mammals and their habitat, which include species that consume both fish and plankton, from the presence and approximately 35-year operation of the Project. While this final rule considers the potential impacts on marine mammal habitat for the 5-year effective period of this rule,

the Biological Opinion provides a comprehensive evaluation of the types and degree of impacts that may occur to marine mammal habitat and its conclusion therein regarding impacts to ESA-listed species and their habitat can be generally applied to all marine mammals considered in this final rule. For reasons described in the Biological Opinion, effects to ESA-listed marine mammal species habitat from the construction and 35-year operation of the Project would be so small that they cannot be meaningfully measured, evaluated, or detected.

As described in the proposed rule and this final rule, the Project Area is not a primary or unique foraging ground for any marine mammal species. While marine mammals do engage in critical behavior such as foraging, mating, and calving in the Project Area (for some species), given the availability of similar habitat nearby, the physical and biological impacts of construction and operation of the Project on marine mammal habitat is not anticipated to be meaningful. NMFS concludes that impacts to marine mammal habitat from presence and operation of Atlantic Shores South during the 5-year effective period of this rule would, similar to the conclusions reached in the Biological Opinion, not have impacts on marine mammal habitat that would result in effects to populations through annual rates of recruitment or survival.

Mitigation To Reduce Impacts on All Species

As previously described in greater detail, this rulemaking includes a variety of mitigation measures designed to minimize to the extent practicable impacts on all marine mammals, with additional mitigation focused on North Atlantic right whales (the latter is described in more detail below). For impact pile driving of WTG, OSS, and Met Tower foundation piles, ten overarching measures are required, which are intended to reduce both the number and intensity of marine mammal takes: (1) seasonal work restrictions; (2) use of multiple PSOs to visually observe for marine mammals (with any detection within specifically designated zones that would trigger a delay or shutdown); (3) use of PAM to acoustically detect marine mammals, with a focus on detecting baleen whales (with any detection within designated zones triggering delay or shutdown); (4) implementation of clearance zones; (5) implementation of shutdown zones; (6) use of soft-start and ramp ups; (7) use of noise attenuation technology (*i.e.*, double bubble curtain); (8) maintaining situational awareness of marine

mammal presence through the requirement that any marine mammal sighting(s) by Project Company 1 personnel must be reported to PSOs; (9) SFV monitoring; and (10) Vessel Strike Avoidance measures to reduce the risk of a collision with a marine mammal and vessel. For temporary cofferdam installation and removal, we are requiring five overarching measures: (1) seasonal/time of day work restrictions; (2) use of multiple PSOs to visually observe for marine mammals (with any detection with specifically designated zones that would trigger a delay or shutdown); (3) implementation of clearance zones; (4) implementation of shutdown zones; and (5) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Project Company 1 personnel must be reported to PSOs. Lastly, for HRG surveys, we are requiring six measures: (1) measures specifically for Vessel Strike Avoidance; (2) specific requirements during daytime and nighttime HRG surveys; (3) implementation of clearance zones; (4) implementation of shutdown zones; (5) use of ramp-up of acoustic sources; and (6) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Project Company 1 personnel must be reported to PSOs.

The Mitigation section discusses the manner in which the required mitigation measures reduce the magnitude and/or severity of takes of marine mammals. Seasonal restrictions on select activities avoid impacts from the activities during the indicated time periods, which are targeted towards times with higher densities or important behaviors. Use of a soft-start during impact pile driving will allow animals to move away from (*i.e.*, avoid) the sound source prior to applying higher hammer energy levels needed to install the pile (Project Company 1 will not use a hammer energy greater than necessary to install piles). Similarly, ramp-up during HRG surveys would allow animals to move away and avoid the acoustic sources before they reach their maximum energy level. For all activities, clearance zone and shutdown zone implementation, which are required when marine mammals are within given distances associated with certain impact thresholds for all activities, will reduce the magnitude and severity of marine mammal take. Additionally, the use of multiple PSOs (WTG, OSS, and Met Tower foundation installation; temporary cofferdam installation and removal; HRG surveys),

PAM operators (for permanent foundation installation), and maintaining awareness of marine mammal sightings reported in the region (WTG, OSS, and Met Tower foundation installation; temporary cofferdam installation and removal; HRG surveys) will aid in detecting marine mammals that would trigger the implementation of the mitigation measures. The reporting requirements including SFV reporting (for foundation installation and foundation operation), will assist NMFS in identifying if impacts beyond those analyzed in this final rule are occurring, potentially leading to the need to enact adaptive management measures in addition to or in place of the mitigation measures.

Mysticetes

Five mysticete species (comprising five stocks) of cetaceans (*i.e.*, North Atlantic right whale, fin whale, humpback whale, minke whale, and sei whale) may be taken by harassment, with three of these listed by the ESA (*i.e.*, North Atlantic right whale, fin whale, sei whale). These species, to varying extents, utilize the specified geographic region, including the Project Area, for the purposes of migration, foraging, and socializing. Mysticetes are in the low-frequency hearing group.

Behavioral data on mysticete reactions to pile-driving noise are scant. Kraus *et al.* (2019) predicted that the three main impacts of offshore wind farms on marine mammals would consist of displacement, behavioral disruptions, and stress. Broadly, we can look to studies that have focused on other noise sources such as seismic surveys and military training exercises, which suggest that exposure to loud signals can result in avoidance of the sound source (or displacement if the activity continues for a longer duration in a place where individuals would otherwise have been staying, which is less likely for mysticetes in this area), disruption of foraging activities (if they are occurring in the area), local masking around the source, associated stress responses, and impacts to prey, as well as TTS or PTS, in some cases.

NMFS reviewed recent PSO observational data from offshore wind projects in southern New England (*i.e.*, South Fork at OCS-A-0517 and Vineyard Wind 1 at OCS-A-0501) where pile driving construction activities occurred. During pile-driving construction activities for Vineyard Wind 1, in 2023 from early June through December (RPS, 2023), there were 36 whale observations consisting of 4 unidentified non-North Atlantic right whales, 17 detections of humpback

whales, eight detections of fin whales, six detections of minke whales, and one unidentified baleen whale (RPS, 2023). Three of these observations of mysticetes (one humpback whale sighting, one fin whale sighting, and one group of three fin whales) occurred while the hammer was engaged (which was operating at full power). Behaviors noted included surfacing, blowing, fluking, and feeding. At South Fork, a total of 39 hours 32 minutes of active impact pile driving was conducted across installation of the 13 monopiles on 15 different days. The most PSO visual watch effort occurred aboard the Boklift 2 (908 hours), and PSO effort from the four dedicated monitoring vessels ranged from 426 to 757 hours. In total (with and without pile driving) foundation installation PSOs observed 348 mysticete groups comprising 552 individuals; 29 of these detections, totaling 51 individuals, occurred during pile driving (table 14 in South Fork Wind (2023)). None of the observed behaviors of mysticetes noted by either the Vineyard Wind 1 or South Fork PSOs were indicative of distress, alarm, or other adverse reactions (RPS, 2023; South Fork Wind, 2023).

Mysticetes encountered in the Project Area are expected to primarily be migrating and may be engaged in opportunistic foraging behaviors. The extent to which an animal engages in these behaviors in the area is species-specific and varies seasonally. Many mysticetes are expected to predominantly be migrating through the Project Area towards or from feeding ground located further north (e.g., southern New England region, Gulf of Maine, Canada). While we acknowledged above that mortality, hearing impairment, or displacement of mysticete prey species may result locally from impact pile driving, the very short duration of and broad availability of prey species in the area and the availability of alternative suitable foraging habitat for the mysticete species most likely to be affected, any impacts on mysticete foraging are expected to be minor. Whales that choose to opportunistically forage and are temporarily displaced from the Project Area are expected to have sufficient remaining similar feeding habitat available to them in the area and, further, would not be prevented from feeding in other areas within the biologically important feeding habitats found further north. In addition, any displacement of whales or interruption of opportunistic foraging bouts would be expected to be relatively temporary in nature.

The potential for repeated exposures is dependent upon the residency time of whales, with migratory animals unlikely to be exposed on repeated occasions and animals remaining in the area to be more likely exposed repeatedly. For mysticetes, where relatively low numbers of species-specific take by Level B harassment are predicted (compared to the abundance of each mysticete species or stock, such as is indicated in table 24) and movement patterns suggest that individuals would not necessarily linger in a particular area for multiple days, each predicted take likely represents an exposure of a different individual with perhaps, for a few species, a subset of takes potentially representing a small number of repeated takes of a limited number of individuals across multiple days. In other words, the behavioral disturbance to any individual mysticete would, therefore, likely occur within a single day within a year, or potentially across a few days.

In general, for this Project, the duration of exposures would not be continuous throughout any given day, and pile driving would not occur on all consecutive days within a given year due to weather delays or any number of logistical constraints Project Company 1 has identified. Species-specific analysis regarding potential for repeated exposures and impacts is provided below.

Fin, humpback, minke, and sei whales are the mysticete species for which PTS is anticipated and allowed (see table 23). As described previously, PTS for mysticetes from impact pile driving may overlap frequencies used for communication, navigation, or detecting prey. However, given the nature and duration of the activity, the mitigation measures, and likely avoidance behavior, any PTS is expected to be of a small degree, would be limited to frequencies where pile-driving noise is concentrated (*i.e.*, only a small subset of their expected hearing range) and would not be expected to impact reproductive success or survival.

North Atlantic Right Whale

North Atlantic right whales are listed as endangered under the ESA, and the western Atlantic stock is considered depleted and strategic under the MMPA. As described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule (88 FR 65430, September 22, 2023), North Atlantic right whales are threatened by a low population abundance, higher than average mortality rates, and lower than average reproductive rates. Recent studies have reported individuals showing high stress levels (*e.g.*,

Corkeron *et al.*, 2017) and poor health, which has further implications on reproductive success and calf survival (Christiansen *et al.*, 2020; Stewart *et al.*, 2021; Stewart *et al.*, 2022). As described below, a UME has been designated for North Atlantic right whales. Given this, the status of the North Atlantic right whale population is of heightened concern and, therefore, merits additional analysis and consideration. No injury or mortality is anticipated or allowed for this species.

For North Atlantic right whales, this final rulemaking allows up to 25 takes, by Level B harassment only, over the 5-year period, with a maximum annual allowable take of 13 (equating to approximately 3.82 percent of the stock abundance, if each take were considered to be of a different individual), with lower numbers than that expected in the years without foundation installation (*e.g.*, years when only cofferdam installation and/or HRG surveys would be occurring). No disruptions to primary foraging or calving is expected from the activities associated with the Project as North Atlantic right whales utilize areas outside of the Project Area for their main feeding, breeding, and calving activities. While opportunistic foraging may occur in the Project Area (see Whitt *et al.* (2013)'s skim feeding observations off the coast of Barnegat Bay, New Jersey), the habitat does not support prime foraging habitat.

The waters off the coast of New Jersey, including those surrounding the Project Area in the NJ WEA, is an important migratory route for the species to the northern feeding areas near the Gulf of Maine and Georges Banks and to their southern breeding and calving grounds off the southeastern U.S. (CETAP, 1982; Knowlton and Kraus, 2001; Knowlton *et al.*, 2022; Biedron *et al.*, 2009; DoC, 2016b). Migrating North Atlantic right whales have been acoustically detected north of the Project Area in the New York Bight from February to May and August through December (Biedron *et al.*, 2009). Similarly, given the species' migratory behavior in the Project Area, we anticipate individual whales would be typically migrating through the area during months when foundation installation would not occur (given the seasonal restrictions on foundation installation, rather than lingering for extended periods of time). While North Atlantic right whale presence in the Project Area is known as being year-round (see Davis *et al.*, 2017), the abundance during summer months is much lower compared to the winter months with spring and fall serving as "shoulder seasons" wherein abundance

waxes (fall) or wanes (spring). The greatest densities occur from December through April (Roberts *et al.*, 2016a; Roberts *et al.*, 2023; Roberts *et al.*, 2024), outside of the months of Project Company 1's planned foundation installation activities and when the seasonal pile driving moratorium would be active (with a limited exception for December, if NMFS approves December foundation pile driving). Therefore, we anticipate that any individual whales would typically be migrating through the Project Area and would not be lingering for extended periods of time and, further, fewer would be present in the months when foundation installation would be occurring. Other activities by Project Company 1 that involve either much smaller harassment zones (e.g., HRG surveys) or are limited in amount (e.g., cable landfall construction) may also occur during periods when North Atlantic right whales are using the habitat for migration. It is important to note the activities that could be occurring from January (and possibly December) through April that may impact North Atlantic right whales would be primarily nearshore cable landfall activities (*i.e.*, cofferdam installation and removal) and HRG surveys. Cofferdam work is restricted to nearshore waters, where the water is shallower and where it is less likely for North Atlantic right whales to be present. HRG surveys would not result in very high received levels or prolonged exposure. As any North Atlantic right whales within the Project Area would likely be engaged in migratory behavior (LaBrecque *et al.*, 2015), it is likely that the allowed instances of take would occur to separate individual whales and, thereby unlikely than any single individual would be taken on more than one day, or possibly two days, within a year. Across all years, if an individual were to be exposed during a subsequent year, the impact of that exposure is likely independent of the previous exposure given the duration between exposures.

As described in the Description of Marine Mammals in the Specific Geographic Region section, North Atlantic right whales are presently experiencing an ongoing UME (beginning in June 2017). Preliminary findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of North Atlantic right whales. Given the current status of the North Atlantic right whale, the loss of even one individual could significantly impact the population. No mortality,

serious injury, or injury of North Atlantic right whales as a result of the Project is expected or allowed. Any disturbance to North Atlantic right whales due to Project Company 1's activities is expected to result in at most temporary avoidance of the immediate area of construction. As no injury, serious injury, or mortality is expected or allowed, and Level B harassment of North Atlantic right whales will be reduced to the level of least practicable adverse impact through use of mitigation measures, the allowed number of takes of North Atlantic right whales would not exacerbate or compound the effects of the ongoing UME.

As described in the general *Mysticetes* section above, foundation installation is likely to result in the highest number of annual takes and is of greatest concern given loud source levels. This activity is expected to consist of an approximate total of 201 days over 2 years for WTG and Met Tower installation. For large OSS foundation installation, it is assumed that up to 24 days are necessary for all 4 large OSS foundations to be installed. For WTGs and the Met Tower using monopiles, this assumes that a single WTG monopile is installed per day (*i.e.*, 24-hour period). For WTGs using jacket foundations within pin piles, this assumes 4 pin piles are installed per day. For OSSs using pin piles, this assumes 4 pin piles are installed per day. If Project Company 1 would, on some days, install up to 2 monopile foundations for WTGs or the Met Tower, this would reduce the overall amount of take as the number of days for total pile driving would be expected to have been reduced, meaning the estimate as presented herein is conservative to assume the maximum installation scenario. Project Company 1 has provided a realistic construction schedule (e.g., Project Company 1's schedule reflects the maximum number of piles they anticipate to be able to drive each month in which pile driving is allowed to occur), although we recognize schedules may shift for a variety of reasons (e.g., weather or supply delays). However, the total number of takes would not exceed the 5-year allowable totals or the maximum annual totals in any given year indicated in tables 23 and 24, respectively. In all cases, these activities would only occur during times when, based on the best available scientific data, North Atlantic right whales are less frequently encountered due to their migratory behavior. The potential types, severity, and magnitude of impacts are

also anticipated to mirror that described in the general *Mysticetes* section above, including avoidance (the most likely outcome), changes in foraging or vocalization behavior, masking, a small amount of TTS, and temporary physiological impacts (e.g., change in respiration, change in heart rate). The effects of the activities are expected to be sufficiently low-level and localized to specific areas as to not meaningfully impact important behaviors such as migratory behavior of North Atlantic right whales. These takes are expected to result in temporary behavioral reactions, such as slight displacement (but not abandonment) of migratory habitat or temporary cessation of feeding. Further, given these exposures are generally expected to occur to different individual right whales migrating through (*i.e.*, most individuals would not be impacted on more than 1 day in a year), with some subset potentially being exposed on no more than a few days within the year, they are unlikely to result in energetic consequences that could affect reproduction or survival of any individuals.

Overall, NMFS expects that any behavioral harassment of North Atlantic right whales incidental to the specified activities would not result in changes to their migration patterns or foraging success, as only temporary avoidance of an area during construction is expected to occur. As described previously, North Atlantic right whales migrating through the Project Area are not expected to remain in this habitat for extensive durations, and any temporarily displaced animals would be able to return to or continue to travel through and opportunistically forage in these areas once activities have ceased.

Although acoustic masking may occur in the vicinity of the foundation installation activities, based on the acoustic characteristics of noise associated with pile driving (e.g., frequency spectra, short duration of exposure) and construction surveys (e.g., intermittent signals), NMFS expects masking effects to be minimal (e.g., impact pile driving) to none (e.g., HRG surveys). In addition, masking would likely only occur during the period of time that a North Atlantic right whale is in the relatively close vicinity of pile driving, which would be rare, given pile driving is intermittent within a day and confined to the months in which North Atlantic right whales are at lower densities and primarily moving through the area, the anticipated mitigation effectiveness, and the likely avoidance behaviors. TTS is another potential form of Level B

harassment that could result in brief periods of slightly reduced hearing sensitivity affecting behavioral patterns by making it more difficult to hear or interpret acoustic cues within the frequency range (and slightly above) of sound produced during impact pile driving; however, any TTS would likely be of low amount, limited duration, and limited to frequencies where most construction noise is centered (below 2 kHz). NMFS expects that right whale hearing sensitivity would return to pre-exposure levels shortly after migrating through the area or moving away from the sound source.

As described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule (88 FR 65430, September 22, 2023), the distance of the receiver to the source influences the severity of response with greater distances typically eliciting less severe responses. NMFS recognizes North Atlantic right whales migrating could be pregnant females (in the fall) and cows with older calves (in spring) and that these animals may slightly alter their migration course in response to any foundation pile driving; however, as described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule (88 FR 65430, September 22, 2023), we anticipate that course diversion would be of small magnitude. Hence, while some avoidance of the pile-driving activities may occur, we anticipate any avoidance behavior of migratory North Atlantic right whales would be similar to that of gray whales (Tyack *et al.*, 1983), on the order of hundreds of meters up to 1 to 2 km (0.62 to 1.24 mi). This diversion from a migratory path otherwise uninterrupted by the Project's activities is not expected to result in meaningful energetic costs that would impact annual rates of recruitment of survival. NMFS expects that North Atlantic right whales would be able to avoid areas during periods of active noise production while not being forced out of this portion of their habitat.

North Atlantic right whale presence in the Project Area is year-round. However, abundance during summer months is lower compared to the winter months with spring and fall serving as "shoulder seasons" wherein abundance waxes (fall) or wanes (spring). Given this year-round habitat usage, in recognition that where and when whales may actually occur during Project activities is unknown as it depends on the annual migratory behaviors, NMFS is requiring a suite of mitigation measures designed to reduce impacts to North Atlantic right whales to the maximum extent practicable.

These mitigation measures (*e.g.*, seasonal/daily work restrictions, vessel separation distances, reduced vessel speed) would not only avoid the likelihood of vessel strikes but also would minimize the severity of behavioral disruptions by minimizing impacts (*e.g.*, through sound reduction using attenuation systems and reduced spatio-temporal overlap of Project activities and North Atlantic right whales). This would further ensure that the number of takes by Level B harassment that are estimated to occur are not expected to affect reproductive success or survivorship via detrimental impacts to energy intake or cow/calf interactions during migratory transit. However, even in consideration of recent habitat use and distribution shifts, Project Company 1 would still be installing foundations when the presence of North Atlantic right whales is expected to be lower.

As described in the Description of Marine Mammals in the Specific Geographic Region section, Project Company 1 would be constructed within the North Atlantic right whale migratory corridor BIA, which represent areas and months within which a substantial portion of a species or population is known to migrate. The width of the Lease is relatively small (26.4 km (16.4 mi) when measured horizontally at the furthest points from the west to east) when compared with the migratory BIA (177.77 km (101.46 mi) when measured horizontally at the furthest points from west to east) The Lease Areas only overlap approximately 14.8 percent of the migratory corridor. The Lease Areas begin approximately 23 km (14.29 mi) east of the closest point on the coastline of New Jersey. While construction activities would be occurring within the migratory path, its placement in deeper waters no closer than 23 km (14.29 mi) offshore and the fact the foundation installation (the most impactful activity) would not occur during the migration period (*i.e.*, no foundation installation would be allowed to occur from December 1st through April 30th, annually, unless Project Company 1 requests and NMFS and other Federal Agency partners approve, a limited amount of pile driving in December) provides high conservation benefits. Overall North Atlantic right whale migration is not expected to be impacted by the planned activities. There are no known North Atlantic right whale feeding, breeding, or calving areas within the Project Area. Prey species are mobile (*e.g.*, calanoid copepods can initiate rapid and directed escape responses) and are broadly

distributed throughout the Project Area (noting again that North Atlantic right whale prey is not particularly concentrated in the Project Area relative to nearby habitats). Therefore, any impacts to prey that may occur are also unlikely to impact marine mammals.

The most significant measure to minimize impacts to individual North Atlantic right whales is the seasonal moratorium on all foundation installation activities from December 1st through April 30th (unless Project Company 1 requests and NMFS and other Federal Agency partners approve a limited amount of pile driving in December), annually, when North Atlantic right whale abundance in the Project Area is expected to be highest. NMFS also expects this measure to greatly reduce the potential for mother-calf pairs to be exposed to impact pile driving noise above the Level B harassment threshold during their annual spring migration through the Project Area from calving grounds to primary foraging grounds (*e.g.*, Cape Cod Bay). NMFS expects that exposures to North Atlantic right whales would be reduced due to the additional mitigation measures that would ensure that any exposures above the Level B harassment threshold would result in only short-term effects to individuals exposed.

Foundation pile driving may only begin in the absence of North Atlantic right whales (based on visual detection and PAM). If foundation pile driving has commenced, NMFS anticipates North Atlantic right whales would avoid the area, utilizing nearby waters to carry on pre-exposure behaviors. However, foundation installation activities must be shut down if a North Atlantic right whale is sighted at any distance or acoustically detected at any distance within the 10-km (6.21-mi) PAM Clearance/Shutdown Zone, unless a shutdown is not feasible due to risk of injury or loss of life. Shutdown may occur anywhere if North Atlantic right whales are seen within or beyond the Level B harassment zone, further minimizing the duration and intensity of exposure. NMFS anticipates that if North Atlantic right whales go undetected and they are exposed to foundation installation noise, it is unlikely a North Atlantic right whale would approach the sound source locations to the degree that they would purposely expose themselves to very high noise levels. This is because typical observed whale behavior demonstrates likely avoidance of harassing levels of sound where possible (Richardson *et al.*, 1985). These measures are designed to avoid PTS and also reduce the severity of Level B

harassment, including the potential for TTS. While some TTS could occur, given the mitigation measures (e.g., delay pile driving upon a sighting or acoustic detection and shutting down upon a sighting or acoustic detection), the potential for TTS to occur is low.

The clearance and shutdown measures are most effective when detection efficacy is maximized, as the measures are triggered by a sighting or acoustic detection. To maximize detection efficacy, NMFS requires the combination of PAM and visual observers. NMFS is requiring communication protocols with other Project vessels, and other heightened awareness efforts (e.g., daily monitoring of North Atlantic right whale sighting databases) such that as a North Atlantic right whale approaches the source (and thereby could be exposed to higher noise energy levels), PSO detection efficacy would increase, the whale would be detected, and a delay to commencing foundation installation or shutdown (if feasible) would occur. In addition, the implementation of a soft-start for foundation impact pile driving would provide an opportunity for whales to move away from the source if they are undetected, reducing received levels. Further, Project Company 1 has committed to not installing two WTG or OSS foundation piles simultaneously. North Atlantic right whales would, therefore, not be exposed to concurrent impact pile driving on any given day from the Project and the area ensounded at any given time would be limited.

Additionally, Project Company 1 did request the ability to perform nighttime pile driving of their foundation piles. In order to receive approval to do so, Project Company 1 is required to provide NMFS with an AMP for review which would describe, in detail, how they would perform and ensure adequate monitoring for protected marine mammal species. This AMP must also describe how mitigative procedures during nighttime (or periods of reduced visibility) would be sufficiently effective and protective. Only upon approval of the AMP would Project Company 1 perform nighttime pile driving. Under approval of an AMP, Project Company 1 is still committed to the installation of up to two monopiles or up to four pin piles per day (which is defined as installation within a 24-hour period). Without a request and approval of the AMP, Project Company 1 would only be able to perform pile driving prior to 1.5 hours before civil sunset and not before 1 hour after civil sunrise. An exception exists due to safety of the crew and stability of the pile whereas if Project Company 1

begins impact pile driving prior to this defined period, they will be allowed to complete the pile. However, even if nighttime pile driving is not carried through with discussions with the applicant but they wish to complete piles after dark that were started outside the temporal restriction period, Project Company 1 is still required to submit for review and approval an AMP to ensure that they can appropriately monitor and mitigate for marine mammals in reduced visibility conditions (i.e., daylight to darkness during active pile driving).

Finally, for HRG surveys, because of the maximum distance to the Level B harassment threshold isopleth (141 m (462.6 ft) via the GeoMarine Geo-Source) as compared to the requirement that vessels maintain a distance of 500 m (1,640 ft) from any North Atlantic right whales, the fact that whales are unlikely to remain in close proximity to an HRG survey vessel for any length of time, and that the acoustic source would be shut down if a North Atlantic right whale is observed within 500 m (1,640 ft) of the source, any exposure to noise levels above the harassment threshold (if any) would be very brief. To further minimize exposures, ramp-up of sparkers and CHIRPs (if applicable) must be delayed during the clearance period if PSOs detect a North Atlantic right whale (or any other ESA-listed species) within 500 m (1,640 ft) of the acoustic source. With implementation of the mitigation requirements, take by Level A harassment is neither anticipated nor allowed during HRG surveys. Potential impacts associated with Level B harassment would include low-level, temporary behavioral modifications, most likely in the form of avoidance behavior. Given the precautions taken to minimize both the number and intensity of Level B harassment on North Atlantic right whales, it is highly unlikely that the anticipated low-level exposures would impact the reproductive success or survival of any marine mammals.

As described previously, no serious injury or mortality, or Level A harassment, of North Atlantic right whale is anticipated or has been allowed. Extensive North Atlantic right whale-specific mitigation measures (beyond the robust suite required for all species) are expected to further minimize the number and severity of takes by Level B harassment. Given the documented habitat use within the area, the majority of the individuals predicted taken (including no more than 25 instances of take, by Level B harassment only, over the course of the 5-year rule, with an annual maximum of no more

than 13 takes) would be impacted on a maximum of 2 days in a year as North Atlantic right whales utilize this area for migration and would be expected to be transiting rather than residing in the area for extended periods of time. Further, any impacts to North Atlantic right whales are expected to be in the form of lower-level behavioral disturbance. Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by Level B harassment anticipated and allowed would have a negligible impact on the North Atlantic right whale stock.

Fin Whale

The fin whale is listed as Endangered under the ESA, and the western North Atlantic stock is considered both Depleted and Strategic under the MMPA. No UME has been designated for this species or stock. No serious injury or mortality is anticipated or allowed for this species.

The rule allows up to 46 takes, by harassment only, over the 5-year effective period of the rule. The maximum annual allowable take, by Level A harassment and Level B harassment, would be 4 and 18, respectively (combined, this annual take ($n=22$) equates to approximately 0.3 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (e.g., years when only HRG surveys would be occurring). The Project Area does not overlap any known areas of specific biological importance to fin whales. It is likely that some subset of the individual whales exposed could be taken several times annually.

Level B harassment is expected to be in the form of behavioral disturbance, primarily resulting in avoidance of the Project Area where foundation installation is occurring, and some low-level TTS and masking that may limit the detection of acoustic cues for relatively brief periods of time. Any potential PTS would be minor (limited to a few dB) and any TTS would be of short duration and concentrated at half or one octave above the frequency band of pile-driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of fin whales.

Fin whales are present in the waters off of New Jersey year round and are one of the most frequently observed large whales and cetaceans in continental shelf waters, principally from Cape Hatteras in the Mid-Atlantic northward to Nova Scotia, Canada (Sergeant, 1977; Sutcliffe and Brodie, 1977; CETAP, 1982; Hain *et al.*, 1992; Geo-Marine, 2010; BOEM 2012; Edwards *et al.*, 2015; Hayes *et al.*, 2022). Fin whales have high relative abundance in the Mid-Atlantic and Project Area, most observations occur in the winter and summer months (Geo-Marine, 2010; Hayes *et al.*, 2022) though detections do occur in spring and fall (Watkins *et al.*, 1987; Clark and Gagnon 2002; Geo-Marine, 2010; Morano *et al.*, 2012). However, fin whales typically feed in waters off of New England and within the Gulf of Maine, areas north of the Project Area, as New England and Gulf of St. Lawrence waters represent major feeding ground for fin whales (Hayes *et al.*, 2022). Hain *et al.* (1992), based on an analysis of neonate stranding data, suggested that calving takes place during October to January in latitudes of the U.S. mid-Atlantic region; however, it is unknown where calving, mating, and wintering occur for most of the population (Hayes *et al.*, 2022).

Given the documented habitat use within the area, some of the individuals taken would likely be exposed on multiple days. However, as described in the Project Area does not include areas where fin whales are known to concentrate for feeding or reproductive behaviors and the predicted takes are expected to be in the form of lower-level impacts. Given the magnitude and severity of the impacts discussed above (including no more than 46 takes by harassment only over the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 4 and 18, respectively), and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on the western North Atlantic stock of fin whales.

Humpback Whale

The West Indies DPS of humpback whales is not listed as threatened or endangered under the ESA, but the Gulf of Maine stock, which includes individuals from the West Indies DPS, is considered Strategic under the

MMPA. However, as described in the Description of Marine Mammals in the Specific Geographic Region section of this preamble, humpback whales along the Atlantic Coast have been experiencing an active UME as elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately 40 percent had evidence of human interaction (*i.e.*, vessel strike or entanglement). Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or DPS of which the Gulf of Maine stock is a part) remains stable at approximately 12,000 individuals.

The rule allows up to 41 takes by harassment only over the 5-year period. The maximum annual allowable take, by Level A harassment and Level B harassment, is 4 and 17, respectively (combined, this maximum annual take ($n=21$) equates to approximately 1.5 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.*, years when only HRG surveys would be occurring). Given that humpback whales have been commonly sighted off of New Jersey, it is likely that some subset of the individual whales exposed could be taken several times annually.

Among the activities analyzed, pile driving is likely to result in the highest number of Level A harassment annual takes (4) of humpback whales, with up to 8 takes by Level A harassment expected over the entire foundation pile driving period (2026–2027). The maximum number of annual take allowed, by Level B harassment, is highest for foundation pile driving ($n=104$; WTGs plus OSS pin piles), with a total of 21 takes by Level B harassment expected of the 2-year foundation pile driving period (2026–2027).

As described in the Description of Marine Mammals in the Specific Geographic Region section, humpback whales are known to occur regularly throughout the coastal and offshore waters of the Mid-Atlantic Bight, including within New Jersey waters, with strong seasonality where peak occurrences occur April to November during the annual movement to feeding grounds that are located from the south of the New England region to the northern area of Norway (Geo-Marine, 2007). Other scientific literature reports sightings of humpback whales in every season, with the majority of sightings occurring during the winter (Whitt *et al.*, 2015; Brown *et al.*, 2019; King *et al.*, 2021; Zoidis *et al.*, 2021). In the western

North Atlantic, humpback whales feed during spring, summer, and fall over a geographic range encompassing the eastern coast of the U.S. Feeding is generally considered to be focused in areas north of the Project Area, including a feeding BIA in the Gulf of Maine/Stellwagen Bank/Great South Channel but has been documented farther south and off the coast of New Jersey. When foraging, humpback whales tend to remain in the area for extended durations to capitalize on the food sources.

Assuming humpback whales who are feeding in waters within or surrounding the Project Area behave similarly, we expect that the predicted instances of disturbance could be comprised of some individuals that may be exposed on multiple days if they are utilizing the area as foraging habitat (but no more than a few days, given the small number of overall takes). Also similar to other baleen whales, if migrating, such individuals would likely be exposed to noise levels from the Project above the harassment thresholds only once during migration through the Project Area.

For all the reasons described in the *Mysticetes* section above, we anticipate the impacts of this harassment to align with those already described. Any potential PTS would be minor (limited to a few dB), any TTS would be of short duration, and both would be concentrated at half or one octave above the frequency band of pile-driving noise (most sound is below 2 kHz), which does not include the full predicted hearing range of humpback whales. As described in the *Mysticete* section above, if PTS is incurred, it would be of a small degree. Any masking or physiological responses would also be of low magnitude and severity for reasons described above.

Given the magnitude and severity of the impacts discussed above (including no more than 41 takes over the course of the 5-year rule, and a maximum annual allowable take, by Level A harassment and Level B harassment, of 8 and 33, respectively), and in consideration of the required mitigation measures and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on the Gulf of Maine stock of humpback whales.

Minke Whale

Minke whales are not listed under the ESA, and the Canadian East Coast stock is not considered Depleted nor strategic under the MMPA. There are no known areas of specific biological importance in or adjacent to the Project Area. As described in the Description of Marine Mammals in the Specific Geographic Region section, a UME has been designated for this species but is pending closure. No serious injury or mortality is anticipated or allowed for this species.

The rule allows up to 360 takes, by harassment only, over the 5-year period. The maximum annual allowable take, by Level A harassment and Level B harassment, would be 17 and 161, respectively (combined, this maximum annual take ($n=178$) equates to approximately 0.8 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (e.g., years when only HRG surveys would be occurring). As described in the Description of Marine Mammals in the Specific Geographic Region section of the proposed rule (88 FR 65430, September 22, 2023), minke whales are common offshore the U.S. Eastern Seaboard with a strong seasonal component in the continental shelf and in deeper, off-shelf waters (CETAP, 1982; Hayes *et al.*, 2022). In the Project area, minke whales are predominantly migratory and their known feeding areas are north, including a feeding BIA in the southwestern Gulf of Maine and George's Bank. Therefore, they would be more likely to be moving through (with each take representing a separate individual), though it is possible that some subset of the individual whales exposed could be taken up to a few times annually.

As described in the Description of Marine Mammals in the Specified Geographic Region section, there is a UME for minke whales (see <https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2024-minke-whale-unusual-mortality-event-along-atlantic-coast>), along the Atlantic coast from Maine through South Carolina, with highest number of deaths in Massachusetts, Maine, and New York, and preliminary findings in several of the whales have shown evidence of human interactions or infectious diseases. However, we note that the population abundance is greater than 21,000 and the take allowed through this action is not expected to exacerbate the UME in any way.

We anticipate the impacts of this harassment to follow those described in the general *Mysticetes* section above. Any potential PTS would be minor (limited to a few dB), any TTS would be of short duration, and both would be concentrated at half or one octave above the frequency band of pile-driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of minke whales. Level B harassment would be temporary, with primary impacts being temporary displacement of the Project Area but not abandonment of any migratory or foraging behavior.

Given the magnitude and severity of the impacts discussed above (including no more than 360 takes of the course of the 5-year rule, and a maximum annual allowable take that is reasonably expected to occur by Level A harassment and Level B harassment, of 17 and 161, respectively), and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on the Canadian Eastern Coastal stock of minke whales.

Sei Whale

Sei whales are listed as Endangered under the ESA, and the Nova Scotia stock is considered both Depleted and Strategic under the MMPA. There are no known areas of specific biological importance in or adjacent to the Project Area and no UME has been designated for this species or stock. No serious injury or mortality is anticipated or allowed for this species.

The rule allows up to 28 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, would be 2 and 11, respectively (combined, this maximum annual take ($n=13$) equates to approximately 0.2 percent of the stock abundance, if each take were considered to be of a different individual). As described in the Description of Marine Mammals in the Area of Specified Activities section of the proposed rule (88 FR 65430, September 22, 2023), most of the sei whale distribution is concentrated in Canadian waters and seasonally in northerly U.S. waters, though they are uncommonly observed in the waters off of New Jersey. Because sei whales are migratory and their known feeding areas are east and north of the Project Area (e.g., there is a

feeding BIA in the Gulf of Maine), they would be more likely to be moving through and, considering this and the very low number of total takes, it is unlikely that any individual would be exposed more than once within a given year.

With respect to the severity of those individual takes by behavioral Level B harassment, we would anticipate impacts to be limited to low-level, temporary behavioral responses with avoidance and potential masking impacts in the vicinity of the turbine installation to be the most likely type of response. Any potential PTS would be minor (limited to a few dB), any TTS would be of short duration, and both would be concentrated at half or one octave above the frequency band of pile-driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of sei whales. Moreover, any TTS would be of a small degree. Any avoidance of the Project Area due to the Project's activities would be expected to be temporary with no abandonment of any migratory or foraging behavior.

Given the magnitude and severity of the impacts discussed above (including no more than 28 takes of the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 2 and 11, respectively), and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on the Nova Scotia stock of sei whales.

Odontocetes

In this section, we include information here that applies to all of the odontocete species and stocks addressed below. Odontocetes include dolphins, porpoises, and all other whales possessing teeth. Nine odontocete species (comprising ten stocks) of cetaceans (i.e., sperm whale, Atlantic spotted dolphin, Atlantic white-sided dolphin, bottlenose dolphin, common dolphin, long-finned pilot whale, short-finned pilot whale, Risso's dolphin, harbor porpoise) may be taken by harassment, with one of these listed by the ESA (i.e., sperm whale). These species, to varying extents, utilize the specified geographic region, including the Project Area, for the purposes of migration, foraging, and socializing. Odontocetes are in the mid-

frequency hearing group. In this section, we further divide them into the following subsections: sperm whales, dolphins and small whales, and harbor porpoises. These sub-sections include more specific information, as well as conclusions for each stock represented.

All of the takes of odontocetes allowed incidental to Project Company 1's specified activities are by pile driving and HRG surveys. No serious injury or mortality is anticipated or allowed. We anticipate that, given ranges of individuals (*i.e.*, that some individuals remain within a small area for some period of time), and non-migratory nature of some odontocetes in general (especially as compared to mysticetes), these takes are more likely to represent multiple exposures of a smaller number of individuals than is the case for mysticetes, though some takes may also represent one-time exposures to an individual. Foundation installation is likely to disturb odontocetes to the greatest extent, compared to HRG surveys. While we expect animals to avoid the area during foundation installation, their habitat range is extensive compared to the area ensouffled during these activities.

As described earlier, Level B harassment may include direct disruptions in behavioral patterns (*e.g.*, avoidance, changes in vocalizations (from masking) or foraging), as well as those associated with stress responses or TTS. Odontocetes are highly mobile species and similar to mysticetes, NMFS expects any avoidance behavior to be limited to the area near the sound source. While masking could occur during foundation installation, it would only occur in the vicinity of and during the duration of the activity, and would not generally occur in a frequency range that overlaps most odontocete communication or any echolocation signals. The mitigation measures (*e.g.*, use of sound attenuation systems, implementation of clearance and shutdown zones) would also minimize received levels such that the severity of any behavioral response would be expected to be less than exposure to unmitigated noise exposure.

Any masking or TTS effects are anticipated to be of low-severity. First, the frequency range of pile driving, the most impactful activity to be conducted in terms of response severity, falls within a portion of the frequency range of most odontocete vocalizations. However, odontocete vocalizations span a much wider range than the low frequency construction activities planned for the Project. As described above, recent studies suggest odontocetes have a mechanism to self-

mitigate (*i.e.*, reduce hearing sensitivity) the impacts of noise exposure, which could potentially reduce TTS impacts. Any masking or TTS is anticipated to be limited and would typically only interfere with communication within a portion of an odontocete's range and as discussed earlier, the effects would only be expected to be of a short duration and, for TTS, a relatively small degree.

Furthermore, odontocete echolocation occurs predominantly at frequencies significantly higher than low frequency construction activities. Therefore, there is little likelihood that threshold shift would interfere with feeding behaviors. For HRG surveys, the sources operate at higher frequencies than foundation installation activities. However, sounds from these sources attenuate very quickly in the water column, as described above. Therefore, any potential for PTS and TTS and masking is very limited. Further, odontocetes (*e.g.*, common dolphins, spotted dolphins, bottlenose dolphins) have demonstrated an affinity to bow-ride actively surveying HRG surveys. Therefore, the severity of any harassment, if it does occur, is anticipated to be minimal based on the lack of avoidance previously demonstrated by these species.

The waters off the coast of New Jersey are used by several odontocete species. However, none except the sperm whale are listed under the ESA, and there are no known habitats of particular importance. In general, odontocete habitat ranges are far-reaching along the Atlantic coast of the U.S. and the waters off of New Jersey, including the Project Area, do not contain any particularly unique odontocete habitat features.

Sperm Whale

Sperm whales are listed as endangered under the ESA, and the North Atlantic stock is considered both Depleted and Strategic under the MMPA. The North Atlantic stock spans the East Coast out into oceanic waters well beyond the U.S. exclusive economic zone. Although listed as endangered, the primary threat faced by the sperm whale across its range (*i.e.*, commercial whaling) has been eliminated. Current potential threats to the species globally include vessel strikes, entanglement in fishing gear, anthropogenic noise, exposure to contaminants, climate change, and marine debris. There is no currently reported trend for the stock and, although the species is listed as endangered under the ESA, there are no specific issues with the status of the stock that cause particular concern (*e.g.*, no UMEs). There are no known areas of

biological importance (*e.g.*, critical habitat or BIAs) in or near the Project Area. No mortality or serious injury is anticipated or allowed for this species.

The rule allows up to 15 takes, by Level B harassment only over the 5-year period. The maximum annual allowable take by Level B harassment, is seven, which equates to approximately 0.12 percent of the stock abundance, if each take were considered to be of a different individual, with no take expected in the years without foundation installation (*e.g.*, years when only HRG surveys would be occurring). Given sperm whale's preference for deeper waters, especially for feeding, it is unlikely that individuals will remain in the Project Area for multiple days, and therefore, the estimated takes likely represent exposures of different individuals on 1 day annually.

If sperm whales are present in the Project Area during any Project activities, they will likely be only transient visitors and not engaging in any significant behaviors. Further, the potential for TTS is low for reasons described in the general *Odontocete* section, but if it does occur, any hearing shift would be small and of a short duration. Because whales are not expected to be foraging in the Project Area, any TTS is not expected to interfere with foraging behavior.

Given the magnitude and severity of the impacts discussed above (including no more than 15 takes, by Level B harassment only, over the course of the 5-year rule, and a maximum annual allowable take of 7), and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by Level B harassment anticipated and allowed will have a negligible impact on the North Atlantic stock of sperm whales.

Dolphins and Small Whales

The 7 species and 8 stocks included in this group (which are indicated in table 2 in the *Delphinidae* families) are not listed under the ESA; however, the Northern Migratory Coastal stock of bottlenose dolphins and short-finned pilot whales are listed as Strategic under the MMPA. There are no known areas of specific biological importance in or around the Project Area. As described above, no UMEs have been designated for any of these species. No serious injury or mortality is anticipated or allowed for these species.

The 7 delphinid species (constituting 8 stocks) with takes allowed for the Project are Atlantic spotted dolphin, Atlantic white-sided dolphin, bottlenose dolphin, common dolphin, long-finned pilot whale, short-finned pilot whale, and Risso's dolphin. The rule would allow for 2 (Atlantic white-sided dolphin) to 3 (Risso's dolphin) takes by Level A harassment and 52 to 8,153 takes (depending on species) by Level B harassment only, over the 5-year period. The maximum annual allowable take for these species by Level A harassment would range from 0 (multiple delphinid species) to 1 (Atlantic white-sided dolphin) and 2 (Risso's dolphin), and Level B harassment would range from 20 (short-finned pilot whale) to 3,836 (bottlenose dolphin—Western North Atlantic Offshore stock). Overall, the maximum annual take equates to approximately 0.11 (short-finned pilot whale) to 29.36 (bottlenose dolphin—Northern Migratory Coastal stock) percent of each species/stock's abundance (species/stock-dependent), if each take were considered to be of a different individual, which is not likely the case, with far lower numbers than that expected in the years without pile driving activities (e.g., years when only HRG surveys would be occurring). Further, though the estimated numbers of take are comparatively higher than the numbers for mysticetes, we note that for all species they are relatively low relative to the population abundance.

The number of takes, likely movement patterns of the affected species, and the intensity of any Level B harassment, combined with the availability of alternate nearby foraging habitat suggests that the likely impacts would not impact the reproduction or survival of any individuals. While delphinids may be taken on several occasions, none of these species are known to have small home ranges within the Project Area or known to be particularly sensitive to anthropogenic noise. Some TTS can occur but it would be limited to the frequency ranges of the activity and any loss of hearing sensitivity is anticipated to return to pre-exposure conditions shortly after the animals move away from the source or the source ceases.

For the two stocks of bottlenose dolphins (Offshore and Northern Migratory Coastal stocks), given both the comparatively higher number of allowed takes for each stock and the higher number of allowed takes relative to each stock's abundance (refer back to table 24), while some of the takes likely represent exposures of different individuals on 1 day a year, it is likely that some subset of the individuals exposed could be taken several times

annually. Further, as for most other dolphin species and as described above for odontocetes broadly, given the number of estimated takes for some species and the behavioral patterns of odontocetes, we anticipate that a fair number of these instances of take in a day represent a few exposures each of a smaller number of individuals, meaning the actual number of individuals taken is lower. Although some amount of repeated exposure to some individuals is likely given the duration of activity planned by Project Company 1, the intensity of any Level B harassment combined with the availability of alternate nearby foraging habitat suggests that the likely impacts would not impact the reproduction or survival of any individuals.

Overall, most of the populations of all delphinid and small whale species and stocks for which we allow take are stable (no declining population trends). For others, two stocks are labeled as strategic (i.e., Northern Migratory Coastal stock of bottlenose dolphins and Western North Atlantic stock of short-finned pilot whales). Neither of these stocks are experiencing existing UMEs. No mortality, serious injury, or Level A harassment is anticipated or allowed for either of these species. Given the magnitude and severity of the impacts discussed above and in consideration of the required mitigation and other information presented, as well as the status of these stocks, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on all of the species and stocks addressed in this section.

Harbor Porpoises

Harbor porpoises are not listed under the ESA, and the Gulf of Maine/Bay of Fundy stock is considered neither depleted nor strategic under the MMPA. The stock is found predominantly in northern U.S. coastal waters (less than 150 m (492.13 ft) depth) and up into Canada's Bay of Fundy (between New Brunswick and Nova Scotia). Although the population trend is not known, there are no UMEs or other factors that cause particular concern for this stock. No mortality or non-auditory injury are anticipated or allowed for this stock.

The rule allows up to 359 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, would be 13 and 191, respectively (combined, this annual take

($n=204$) equates to approximately 0.24 percent of the stock abundance, if each take were considered to be of a different individual). Given the number of takes, while many of the takes likely represent exposures of different individuals on 1 day a year, some subset of the individuals exposed could be taken up to a few times annually.

Regarding the severity of takes by Level B harassment, because harbor porpoises are particularly sensitive to noise, it is likely that a fair number of the responses could be of a moderate nature, particularly to pile driving. In response to pile driving, harbor porpoises are likely to avoid the area during construction, as previously demonstrated in Tougaard *et al.* (2009) in Denmark, in Dahne *et al.* (2013) in Germany, and in Vallejo *et al.* (2017) in the United Kingdom, although a study by Graham *et al.* (2019) may indicate that the avoidance distance could decrease over time. Given no primary foraging habitat is known off the New Jersey coast, any avoidance of the area by individuals is not likely to impact the reproduction or survival of any individuals as the porpoises would be able to seek alternative foraging areas.

With respect to PTS and TTS, the effects on an individual are likely relatively low given the frequency bands of pile driving (most energy below 2 kHz) compared to harbor porpoise hearing (150 Hz to 160 kHz peaking around 40 kHz). Specifically, TTS is unlikely to impact hearing ability in their more sensitive hearing ranges, or the frequencies in which they communicate and echolocate. We expect any PTS that may occur to be within the very low end of their hearing range where harbor porpoises are not particularly sensitive and any PTS would be of small magnitude. As such, any PTS would not interfere with key foraging or reproductive strategies necessary for reproduction or survival.

As discussed in Hayes *et al.* (2022), harbor porpoises are seasonally distributed. During fall (October through December) and spring (April through June), harbor porpoises are widely dispersed from New Jersey to Maine, with lower densities farther north and south. 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 non-summer months they have been seen from the coastline to deep waters (>1,800 m (>5,905.5 ft); Westgate *et al.*, 1998), although the majority are found over the continental shelf. While harbor porpoises are likely to avoid the area

during any of the Project's construction activities, as demonstrated during European wind farm construction, the time of year in which work would occur is when harbor porpoises are not in highest abundance, and any work that does occur would not result in the species' abandonment of the waters off of New Jersey.

Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on the Gulf of Maine/Bay of Fundy stock of harbor porpoises.

Phocids (Harbor Seals and Gray Seals)

The harbor seal and gray seal are not listed under the ESA, and neither the western North Atlantic stock of gray seal nor the western North Atlantic stock of harbor seal are considered depleted or strategic under the MMPA. There are no known areas of specific biological importance in or around the Project Area. As described in the Description of Marine Mammals in the Specific Geographic Region section, a UME has been designated for harbor seals and gray seals and is described further below. No serious injury or mortality is anticipated or allowed for this species.

For the harbor seals, this rule allows up to 1,582 takes (12 by Level A harassment and 1,570 by Level B harassment) over the 5-year period. For gray seals, this rule allows up to 702 takes (4 by Level A harassment and 698 by Level B harassment) over the 5-year period. The maximum annual allowable take for each species by Level A harassment would be 2 (gray seal) and 8 (harbor seal), and 323 (gray seal) and 738 (harbor seal) by Level B harassment. Combined, the maximum annual take for each species ($n=325$ for gray seals and $n=738$ for harbor seals) equates to approximately 1.16 and 1.22 percent of the stock abundance, respectively, if each take were considered to be of a different individual). Though harbor seals and gray seals are considered migratory and no specific feeding areas have been designated in the area, the higher number of takes relative to the stock abundance suggests that while some of the takes likely represent exposures of different individuals on 1 day a year, it is likely that some subset of the individuals exposed could be taken several times annually.

Harbor and gray seals occur in New Jersey waters most often from December through April, with harbor seal occurrences being more common than gray seals (Reynolds, 2021). Seals are more likely to be close to shore (e.g., closer to the edge of the area ensounded above NMFS' harassment threshold), such that exposure to foundation installation would be expected to be at comparatively lower levels. A study by Toth *et al.* (2018) found that harbor seals forage on a variety of prey and do not appear to be food specialists and that they might utilize both oceanic environments, as well as more nearshore and shallower estuarine environments for foraging. As described in the Potential Effects to Marine Mammals and Their Habitat section in the proposed rule (88 FR 65430, September 22, 2023), construction of wind farms in Europe resulted in pinnipeds temporarily avoiding construction areas but returning within short time frames after construction was complete (Carroll *et al.*, 2010; Hamre *et al.*, 2011; Hastie *et al.*, 2015; Russell *et al.*, 2016; Brasseur *et al.*, 2010). Effects on pinnipeds that are taken by Level B harassment in the Project Area would likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals would simply move away from the sound source and be temporarily displaced from those areas (see Lucke *et al.*, 2006; Edren *et al.*, 2010; Skeate *et al.*, 2012; Russell *et al.*, 2016).

Given the low anticipated magnitude of impacts from any given exposure (e.g., temporary avoidance), even repeated Level B harassment across a few days of some small subset of individuals, which could occur, is unlikely to result in impacts on the reproduction or survival of any individuals. Moreover, pinnipeds would benefit from the mitigation measures described in 50 CFR part 217—Regulations Governing the Taking and Importing of Marine Mammals Incidental to Specified Activities.

As described above, noise from pile driving is mainly low frequency and, while any PTS and TTS that does occur would fall within the lower end of pinniped hearing ranges (50 Hz to 86 kHz), PTS and TTS would not occur at frequencies around 5 kHz where pinniped hearing is most susceptible to noise-induced hearing loss (Kastelein *et al.*, 2018). In summary, any PTS and TTS would be of small degree and not occur across the entire, or even most sensitive, hearing range. Hence, any impacts from PTS and TTS are likely to

be of low severity and not interfere with behaviors critical to reproduction or survival.

Elevated numbers of harbor seal and gray seal mortalities were first observed in July 2018 and occurred across Maine, New Hampshire, and Massachusetts until 2020 (see <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2020-pinniped-unusual-mortality-event-along>). Based on tests conducted so far, the main pathogen found in the seals belonging to that UME was phocine distemper virus, although additional testing to identify other factors that may be involved in this UME are underway. This UME is pending closure and considered nonactive. In 2022, another UME was declared is occurring in Maine with some harbor and gray seals testing positive for highly pathogenic avian influenza (HPAI) H5N1 (see <https://www.fisheries.noaa.gov/marine-life-distress/2022-pinniped-unusual-mortality-event-maine-closed>). For harbor seals, the population abundance is over 61,000 and annual M/SI ($n=339$) is well below PBR (1,729) (per the draft 2023 SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>). The population abundance for gray seals in the United States is over 27,000, with an estimated overall abundance, including seals in Canada, of approximately 450,000. In addition, the abundance of gray seals is likely increasing in the U.S. Atlantic, as well as in Canada (per the draft 2023 SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>). As no injury, serious injury, or mortality is expected or allowed, and Level B harassment of gray and harbor seals will be reduced to the level of least practicable adverse impact through use of mitigation measures, the allowed number of takes would not exacerbate or compound the effects of the ongoing UME. The 2022 UME has since been closed.

Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, Project Company 1's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and allowed will have a negligible impact on harbor and gray seals.

Small Numbers

As noted above, only small numbers of incidental take may be allowed 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 estimated to be taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an ITA 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.

NMFS is authorizing incidental take by Level A harassment and/or Level B harassment only of 16 species of marine mammals (with 17 managed stocks). No mortality or serious injury has been allowed in this final rulemaking. The maximum number of instances of takes by combined Level A harassment and Level B harassment possible within any 1 year relative to the best available population abundance is less than one-third for all species and stocks potentially impacted (see table 24). Further, as described above, for most species, including the Northern Migratory Coastal stock of Bottlenose dolphins which have the highest percentage (29.36), a subset of the instances of take enumerated are expected to represent repeated takes of the same individuals, which means that the numbers of individuals taken are a lower percentage than those listed in table 23 for instances of takes. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers (86 FR 5322, January 19, 2021).

Based on the analysis contained herein of the activities and the anticipated take of marine mammals, NMFS 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.

Classification

Endangered Species Act (ESA)

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 the promulgation of rulemakings, NMFS consults internally whenever we propose to allow take for endangered or threatened species, in this case with the NMFS GARFO.

There are four marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA that may be taken by harassment incidental to construction of the Atlantic Shores South Project: (1) the North Atlantic right whale; (2) sei whale, (3) fin whale, and (4) sperm whale. The Permit and Conservation Division requested initiation of section 7 consultation on July 19, 2023 with NMFS GARFO on the issuance of these regulations and associated 5-year LOA under section 101(a)(5)(A) of the MMPA.

NMFS issued a Biological Opinion on December 18, 2023 concluding that the promulgation of the rule and issuance of LOA thereunder is not likely to jeopardize the continued existence of threatened and endangered species under NMFS' jurisdiction and is not likely to result in the destruction or adverse modification of designated or proposed critical habitat. The Biological Opinion is available at: <https://www.fisheries.noaa.gov/s3/2024-02/GARFO-2023-01804.pdf>.

Project Company 1 is required to abide by the promulgated regulations, as well as the reasonable and prudent measures and terms and conditions of the Biological Opinion and Incidental Take Statement, as issued by NMFS.

National Environmental Policy Act (NEPA)

To comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order 216–6A, NMFS must evaluate our proposed action (*i.e.*, promulgation of regulation) and alternatives with respect to potential impacts on the human environment. NMFS participated as a cooperating agency on the BOEM final Environmental Impact Statement (FEIS)

for the Atlantic Shores South Project offshore New Jersey (2024 Atlantic Shores South FEIS), which was finalized on May 31, 2024 (89 FR 47174) and is available at: <https://www.boem.gov/renewable-energy/state-activities/atlantic-shores-south>. In accordance with 40 CFR 1506.3, NMFS independently reviewed and evaluated the 2024 Atlantic Shores South FEIS and determined that it is adequate and sufficient to meet our responsibilities under NEPA for the promulgation of this rule and issuance of the associated LOA. NMFS, therefore, has adopted the 2024 Atlantic Shores South FEIS through a joint Record of Decision (ROD) with BOEM. The joint ROD for adoption of the 2024 Atlantic Shores South FEIS and promulgation of this final rule and subsequent issuance of LOA can be found at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>.

Executive Order 12866 (as Amended by Executive Order 14094)

The Office of Management and Budget (OMB) has determined that this rule is not significant for purposes of Executive Order 12866 (58 FR 51735, September 30, 1993; as amended by Executive Order 14094 (88 FR 21879, April 11, 2023)).

Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*) and Executive Order 13272 (67 FR 53461, August 16, 2002), the Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration during the proposed rule stage that this action would not have a significant economic impact on a substantial number of small entities. The factual basis for the certification was published in the proposed rule and is not repeated here. No comments were received regarding this certification. As a result, a regulatory flexibility analysis was not required and none was prepared.

Paperwork Reduction Act

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) (44 U.S.C. 3501–3520) unless that collection of information displays a currently valid OMB control number. These requirements have been approved by OMB under control number 0648–0151

and include applications for regulations, subsequent LOA, and reports. Send comments regarding any aspect of this data collection, including suggestions for reducing the burden, to NMFS.

Coastal Zone Management Act (CZMA)

The Coastal Zone Management Act requires that any applicant for a required Federal license or permit to conduct an activity, within the coastal zone or within the geographic location descriptions (*i.e.*, areas outside the coastal zone in which an activity would have reasonably foreseeable coastal effects), affecting any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. NMFS determined that Project Company 1's application for ITRs is an unlisted activity and, thus, is not subject to Federal consistency requirements in the absence of the receipt and prior approval of an unlisted activity review request from the state by the Director of NOAA's Office for Coastal Management. Pursuant to 15 CFR 930.54, NMFS published a NOR of Project Company 1's application in the **Federal Register** on September 29, 2022 (87 FR 59061), a notice regarding an extension to the application public comment period on October 28, 2022 (87 FR 65193) and published the proposed rule on September 22, 2023 (88 FR 65430). The state of New Jersey did not request approval from the Director of NOAA's Office for Coastal Management to review Project Company 1's application as an unlisted activity, and the time period for making such request has expired. Therefore, NMFS has determined the ITA is not subject to Federal consistency review.

List of Subjects in 50 CFR Part 217

Administrative practice and procedure, Endangered and threatened species, Fish, Fisheries, Marine mammals, Penalties, Reporting and recordkeeping requirements, Transportation, Wildlife.

Dated: August 27, 2024.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For reasons set forth in the preamble, NMFS amends 50 CFR part 217 to read as follows:

PART 217—REGULATIONS GOVERNING THE TAKING AND IMPORTING OF MARINE MAMMALS INCIDENTAL TO SPECIFIED ACTIVITIES

■ 1. The authority citation for part 217 continues to read:

Authority: 16 U.S.C. 1361 *et seq.*, unless otherwise noted.

■ 2. Add subpart EE, consisting of §§ 217.300 through 217.309, to read as follows:

Subpart EE—Taking Marine Mammals Incidental to the Atlantic Shores South Project Offshore of New Jersey

Sec.

217.300 Specified activity and specified geographical region.

217.301 Effective dates.

217.302 Permissible methods of taking.

217.303 Prohibitions.

217.304 Mitigation requirements.

217.305 Monitoring and reporting requirements.

217.306 Letter of Authorization.

217.307 Modifications of Letter of Authorization.

217.308–217.309 [Reserved]

Subpart EE—Taking Marine Mammals Incidental to the Atlantic Shores South Project Offshore of New Jersey

§ 217.300 Specified activity and specified geographical region.

(a) This subpart applies to activities associated with the Atlantic Shores South Project (hereafter referred to as the "Project") by Atlantic Shores Offshore Wind Project 1, LLC (*i.e.*, Project Company 1), a joint venture between EDF-RE Offshore Development LLC (a wholly owned subsidiary of EDF Renewables, Inc.) and Shell New Energies US LLC (and a subsidiary of Atlantic Shores Offshore Wind LLC), collectively and hereafter referred to as the Letter of Authorization Holder, or "LOA Holder", and those persons it authorizes or funds to conduct activities on its behalf in the area outlined in paragraph (b) of this section. Requirements imposed on LOA Holder must be implemented by those persons it authorizes or funds to conduct activities on its behalf.

(b) The specified geographical region is the Mid-Atlantic Bight, which includes, but is not limited to, the Bureau of Ocean Energy Management (hereafter, "BOEM") lease areas on the Outer Continental Shelf (hereafter, "OCS")—A-0499 and OCS-A-0570 Commercial Lease of Submerged Lands

for Renewable Energy Development (hereafter, "Lease Areas"), two export cable routes, and two sea-to-shore transition points located at the Atlantic City and the Monmouth landfall locations.

(c) The specified activities are impact pile driving of wind turbine generators (hereafter, "WTG"), offshore substations (hereafter, "OSS"), and a meteorological tower (hereafter, "Met Tower"); vibratory pile driving (installation and subsequent removal) of cofferdams; fishery and ecological monitoring surveys; placement of scour protection; trenching, laying, and burial activities associated with the installation of the export cable from OSSs to shore-based converter stations and inter-array cables between turbines; high-resolution geophysical (hereafter, "HRG") site characterization surveys; vessel transit within the specified geographical region to transport crew, supplies, and materials; and WTG operation.

§ 217.301 Effective dates.

This subpart is effective from January 1, 2025, through December 31, 2029.

§ 217.302 Permissible methods of taking.

Under the LOA, issued pursuant to §§ 216.106 and 217.306, LOA Holder and those persons it authorizes or funds to conduct activities on its behalf may incidentally, but not intentionally, take marine mammals within BOEM Lease Areas, along export cable routes, and the two sea-to-shore transition points located in New Jersey at Atlantic City and Monmouth in the following ways, provided LOA Holder is in complete compliance with all terms, conditions, and requirements of the regulations in this subpart and the appropriate LOA:

(a) By Level B harassment associated with the acoustic disturbance resulting from impact pile driving of WTG, OSS, and Met Tower foundations, vibratory pile driving of temporary cofferdams, and HRG site characterization surveys; and

(b) By Level A harassment associated with the acoustic injury of marine mammals by impact pile driving WTG, OSS, and Met Tower foundations.

(c) Take by mortality (death) or serious injury of any marine mammal species is not authorized.

(d) The incidental take of marine mammals by the activities listed in paragraphs (a) and (b) of this section is limited to the following stocks:

TABLE 1 TO PARAGRAPH (d)

Marine mammal species	Scientific name	Stock
North Atlantic right whale	<i>Eubalaena glacialis</i>	Western North Atlantic.
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic.
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine.
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian Eastern Coastal.
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia.
Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic.
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic.
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic.
Bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic—Offshore. Northern Migratory Coastal.
Common dolphin	<i>Delphinus delphis</i>	Western North Atlantic.
Long-finned pilot whale	<i>Globicephala melas</i>	Western North Atlantic.
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Western North Atlantic.
Risso's dolphin	<i>Grampus griseus</i>	Western North Atlantic.
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy.
Gray seal	<i>Halichoerus grypus</i>	Western North Atlantic.
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic.

§ 217.303 Prohibitions.

Except for the takings described in § 217.302 and authorized by LOA issued under § 217.306 or § 217.307, it is unlawful for any person to do any of the following in connection with the activities described in this subpart:

- (a) Violate, or fail to comply with, the terms, conditions, and requirements of this subpart or LOA issued under § 217.306 or § 217.307;
- (b) Take any marine mammal not specified in § 217.302(d);
- (c) Take any marine mammal specified in the LOA in any manner other than as specified in the LOA; or
- (d) Take any marine mammal specified in § 217.302(d), after NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammals.

§ 217.304 Mitigation requirements.

When conducting the activities identified in § 217.300(c) within the area described in § 217.300(b), LOA Holder must implement the mitigation measures contained in this section and any LOA issued under §§ 217.306 or 217.307. These mitigation measures include, but are not limited to:

- (a) *General conditions.* LOA Holder must comply with the following general measures:
 - (1) A copy of any issued LOA must be in the possession of LOA Holder and its designees, all vessel operators, visual protected species observers (PSOs), passive acoustic monitoring (PAM) operators, pile driver operators, and any other relevant designees operating under the authority of the issued LOA;
 - (2) LOA Holder must conduct training for construction, survey, vessel personnel, and the marine mammal monitoring team (PSO and PAM operators) prior to the start of all in-

water activities in order to explain responsibilities, communication procedures, marine mammal detection and identification, mitigation, monitoring, and reporting requirements, safety and operational procedures, and authorities of the marine mammal monitoring team(s). This training must be repeated for new personnel who join the work during the Project. A description of the training program must be provided to NMFS at least 60 calendar days prior to the initial training before in-water activities begin. NMFS Office of Protected Resources will review, provide comments (if warranted) and approve the training program prior to on-water construction beginning. Confirmation of all required training must be documented on a training course log sheet and reported to NMFS Office of Protected Resources prior to initiating Project activities;

(3) Prior to and when conducting any in-water specified activities and vessel operations, LOA Holder personnel and contractors (e.g., vessel operators, PSOs) must use available sources of information on North Atlantic right whale presence in or near the Project Area including daily monitoring of the Right Whale Sightings Advisory System, NMFS' website at: <https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>, and monitoring the U.S. Coast Guard's VHF Channel 16 throughout the day to receive notification of any sightings and/or information associated with any Slow Zones (i.e., Dynamic Management Areas (DMAs) and/or acoustically-triggered Slow Zones) to provide situational awareness for both vessel operators, PSO(s) and PAM operator(s) teams. The marine mammal monitoring team must

monitor these systems no less than every 4 hours every day;

(4) Any marine mammal observed by Project personnel must be immediately communicated to any on-duty PSO(s), PAM operator(s), and all vessel captains. Any large whale observation or acoustic detection by a PSO(s) or a PAM operator(s) must be conveyed to all vessel captains;

(5) For North Atlantic right whales, any visual detection by a PSO or acoustic detection by a PAM operator at any distance (where applicable for the specified activities) within the PAM Clearance/Shutdown Zone must trigger a delay to the commencement of pile driving and HRG surveys;

(6) In the event that a large whale is sighted or acoustically detected that cannot be confirmed as a non-North Atlantic right whale, it must be treated as if it were a North Atlantic right whale for purposes of mitigation;

(7) Any PSO has the authority to call for a delay or shutdown of Project activities. If a delay to commencing an activity is called for by a PSO, LOA Holder must take the required mitigative action. If a shutdown of an activity is called for by a PSO, LOA Holder must take the required mitigative action unless shutdown would result in imminent risk of injury or loss of life to an individual(s), pile refusal, or pile instability. Any disagreements between the Lead PSO and the activity operator or between the Lead PSO and another PSO/PAM operator regarding delays or shutdowns must only be discussed after the mitigative action has occurred;

(8) Any marine mammals observed within a clearance or shutdown zone must leave (of their own volition) prior to commencing pile driving activities or HRG surveys;

(9) If an individual from a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized take number has been met, is observed entering or within the relevant clearance zone prior to beginning a specified activity, the activity must be delayed. If an activity is ongoing and an individual from a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized take number has been met, is observed entering or within the relevant shutdown zone, the activity must be shut down (*i.e.*, cease) immediately, unless shutdown would result in imminent risk of injury or loss of life to an individual(s), pile refusal, or pile instability. The activity must not commence or resume until the animal(s) has been confirmed to have left the clearance or shutdown zones and is on a path away from the applicable zone or after 15 minutes with no further sightings for small odontocetes and pinnipeds or 30 minutes with no further sightings for all other species;

(10) For in-water construction heavy machinery activities listed in § 217.300(c), if a marine mammal is on a path towards or comes within 10 meters (m) (32.8 feet (ft)) of equipment, LOA Holder must cease operations until the marine mammal has moved more than 10 m on a path away from the activity to avoid direct interaction with equipment;

(11) All vessels must be equipped with a properly installed, operational Automatic Identification System (AIS) device and LOA Holder must report all Maritime Mobile Service Identity (MMSI) numbers to NMFS Office of Protected Resources (pr.itp.monitoringreports@noaa.gov) prior to initial vessel transit;

(12) By accepting the LOA, LOA Holder consents to on-site observation and inspections by Federal agency personnel (including NOAA personnel) during activities described in this subpart, for the purposes of evaluating the implementation and effectiveness of measures contained within the LOA and this subpart; and

(13) It is prohibited to assault, harm, harass (including sexually harass), oppose, impede, intimidate, impair, or in any way influence or interfere with a PSO, PAM Operator, or vessel crew member acting as an observer, or attempt the same. This prohibition includes, but is not limited to, any action that interferes with an observer's responsibilities, or that creates an intimidating, hostile, or offensive environment. Personnel may report any

violations to the NMFS Office of Law Enforcement.

(b) *Vessel strike avoidance measures.* LOA Holder must comply with the following vessel strike avoidance measures while in the specific geographic region, unless a deviation is necessary to maintain safe maneuvering speed and justified because the vessel is in an area where oceanographic, hydrographic, and/or meteorological conditions severely restrict the maneuverability of the vessel; an emergency situation presents a threat to the health, safety, or life of a person(s); or when a vessel is actively engaged in emergency rescue or response duties, including vessel-in distress or environmental crisis response. An emergency is defined as a serious event that occurs without warning and requires immediate action to avert, control, or remedy harm. Speed over ground will be used to measure all vessel speeds:

(1) Prior to the start of the Project's activities involving vessels, all vessel personnel must receive a protected species training that covers, at a minimum, identification of marine mammals that have the potential to occur where vessels would be operating; detection and observation methods in both good weather conditions (*i.e.*, clear visibility, low winds, low sea states) and bad weather conditions (*i.e.*, fog, high winds, high sea states, with glare); sighting communication protocols; all vessel speed and approach limit mitigation requirements (*e.g.*, vessel strike avoidance measures); and information and resources available to the Project personnel regarding the applicability of Federal laws and regulations for protected species. This training must be repeated for any new vessel personnel who join the Project. Confirmation of the vessel personnel's training and understanding of the Incidental Take Authorization (hereafter, "ITA") requirements must be documented on a training course log sheet and reported to NMFS within 30 calendar days of completion of training;

(2) All vessel operators, operating at any speed and regardless of their vessel's size, must slow down, stop their vessel, or alter course to avoid striking any marine mammal;

(3) While in transit, all vessels, regardless of their size, must have a dedicated visual observer aboard and on duty at all times whose sole responsibility (*i.e.*, must not have duties other than observing) is to monitor for marine mammals within a 180 degrees (hereafter, "°") direction of the forward path of the vessel (90° port to 90° starboard) located at an appropriate

vantage point for ensuring vessels are maintaining appropriate separation distances. Visual observers must be equipped with alternative monitoring technology (*e.g.*, night vision devices, infrared cameras) for periods of low visibility (*e.g.*, darkness, rain, fog, *etc.*). The dedicated visual observer must receive prior training on protected species detection and identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements in this subpart. These visual observers may be third-party observers (*i.e.*, NMFS-approved PSOs; see § 217.305(a)) or trained crew members (see paragraph (b)(1) of this section);

(4) At the onset of transiting and continuously thereafter, vessel operators must monitor the U.S. Coast Guard's VHF Channel 16, over which North Atlantic right whale sightings are broadcasted. At the onset of transiting and at least once every 4 hours, vessel operators and/or trained crew member(s) must also monitor the Project's Situational Awareness System (if applicable), WhaleAlert, NMFS' website at: <https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>, and relevant NOAA information systems such as the Right Whale Sighting Advisory System (hereafter, "RWSAS") for the presence of North Atlantic right whales;

(5) Any large whale sighting by any Project-personnel, including any LOA Holder staff, contractors, or vessel crew, must be immediately communicated to all Project-associated vessel operators, PSOs, and PAM operators for situational awareness. Conversely, any large whale observation or detection via a sighting network (*e.g.*, *Mysticetus* or similar software) by PSOs or PAM operators must be conveyed to vessel operator(s) and crew. An ongoing large whale sighting log sheet must be maintained on each vessel and retained for vessel operator(s) review each day prior to first day's transit for awareness of recent sightings;

(6) All vessel operators must abide by existing applicable vessel speed regulations (see 50 CFR 224.105). Nothing in this subpart exempts vessels from any other applicable marine mammal speed or approach regulations;

(7) Vessels must transit at 10 kn (11.5 mph) or less within any active North Atlantic right whale Slow Zone (*i.e.*, Dynamic Management Areas (hereafter, "DMA") or acoustically triggered slow zone);

(8) All vessel operators, regardless of their vessel's size, must immediately reduce vessel speed to 10 kn (11.5 mph) or less for at least 24 hours when a North Atlantic right whale is sighted at any distance by any Project-related personnel or acoustically detected by any Project-related PAM system. Each subsequent observation or acoustic detection in the Project Area shall trigger an additional 24-hour period. If a North Atlantic right whale is reported by Project personnel or via any of the monitoring systems (refer back to paragraph (b)(4) of this section) that vessel must operate at 10 kn (11.5 mph) or less for 24 hours following the reported detection;

(9) All vessels, regardless of size, must immediately reduce speed to 10 kn (11.5 mph) or less when any large whale, mother/calf pairs, or large assemblages of cetaceans are observed within 500 m (1,640 ft) of an underway vessel;

(10) If vessel(s) are traveling at speeds greater than 10 kn (11.5 mph) (*i.e.*, during periods where no other speed restrictions are enacted) in the transit corridor (defined as from a port to the Lease Areas or return), in addition to the required dedicated visual observer, LOA Holder must monitor the transit corridor in real-time with PAM prior to and during transits. If a North Atlantic right whale is detected via visual observation or PAM detection within or approaching the transit corridor, all vessels in the transit corridor must travel at 10 kn (11.5 mph) or less for 24 hours following the detection. Each subsequent detection shall trigger a 24-hour reset. A slowdown in the transit corridor expires when there has been no further visual or acoustic detection in the transit corridor in the past 24 hours;

(11) All vessels must maintain a minimum separation distance of 500 m (1,640 ft) from North Atlantic right whales. If underway, all vessels must steer a course away from any sighted North Atlantic right whale at 10 kn (11.5 mph) or less such that the 500-m (1,640-ft) minimum separation distance requirement is not violated. If a North Atlantic right whale is sighted within 500 m (1,640 ft) of an underway vessel, that vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m (1,640 ft). If a large whale is observed but cannot be confirmed as a species other than a North Atlantic right whale, the vessel operator must assume that it is a North Atlantic right whale and take the vessel strike avoidance measures described in this paragraph;

(12) All vessels must maintain a minimum separation distance of 500 m (1,640 ft) from all ESA-listed large whales (*i.e.*, sperm whales, fin whales, sei whales). If one of these species is sighted within 500 m (1,640 ft) of a transiting vessel, the vessel must shift the engine(s) to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m (1,640 ft);

(13) All vessels must maintain a minimum separation distance of 100 m (328 ft) from all non-ESA-listed large whales (*i.e.*, humpback whales and minke whales). If one of these species is sighted within 100 m (328 ft) of a transiting vessel, the vessel must shift the engine(s) to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 100 m (328 ft);

(14) All vessels must maintain a minimum separation distance of 50 m (164 ft) from all delphinid cetaceans and pinnipeds with an exception made for those that approach the vessel (*i.e.*, bow-riding dolphins). If a delphinid cetacean or pinniped is sighted within 50 m (164 ft) of a transiting vessel, the vessel must shift the engine to neutral, with an exception made for those that approach the vessel (*e.g.*, bow-riding dolphins). Engines must not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m (164 ft);

(15) When a marine mammal(s) is sighted while the vessel(s) is transiting, the vessel must take action as necessary to avoid violating the relevant separation distances (*e.g.*, attempt to remain parallel to the animal's course, slow down, and avoid abrupt changes in direction until the animal has left the area). This measure does not apply to any vessel towing gear or any situation where respecting the relevant separation distance would be unsafe (*i.e.*, any situation where the vessel is navigationally constrained);

(16) All vessels underway must not divert or alter course to approach any marine mammal;

(17) Vessel operators must check, daily, for information regarding the establishment of mandatory or voluntary vessel strike avoidance areas (*i.e.*, Dynamic Management Areas (DMAs), Seasonal Management Areas (SMAs), Slow Zones) and any information regarding North Atlantic right whale sighting locations; and

(18) LOA Holder must submit a North Atlantic Right Whale Vessel Strike Avoidance Plan (hereafter, "VSAP") to NMFS Office of Protected Resources for review and approval at least 180 calendar days prior to the planned start of vessel activity. The VSAP must

provide details on the vessel-based observer and PAM protocols for transiting vessels in the vessel transit corridor. If the VSAP is not submitted and approved by NMFS prior to vessel operations, all Project vessels must travel at speeds of 10 kn (11.5 mph) or less. LOA Holder must comply with any approved VSAP.

(c) *WTG, OSS, and Met Tower foundation installation.* LOA Holder must comply with the following WTG, OSS, and Met Tower foundation installation measures unless doing so could result in imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or the lead engineer determines there is risk of pile refusal or pile instability:

(1) Foundation installation via impact pile driving must not occur December 1st through April 30th, annually, wherein foundation installation via impact pile driving must be avoided in December unless necessary to complete Project 1 or Project 2 in a given year and after receipt of prior approval by NMFS. Before any December pile driving may occur, and for NMFS Office of Protected Resources to fully evaluate this request, LOA Holder is required to provide a written request by October 15th, which must include, but is not limited to the following information: the installation schedule and types of piles to be installed, the maximum number of piles anticipated to be installed in December, and any planned or additional practicable mitigative measures that could be implemented to further reduce activities to North Atlantic right whales and other marine mammal species;

(2) Monopiles must be no larger than 15-m in diameter, representing the larger end of the planned monopile design. During all monopile installation, the minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. Hammer energies must not exceed 4,400 kilojoules (kJ) for monopile installation. No more than two monopiles may be installed per day;

(3) Pin piles must be no larger than 5-m in diameter. During all pin pile installation, the minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. Hammer energies must not exceed 2,500 kJ for pin pile installation. No more than four pin piles may be installed per day;

(4) LOA Holder must only perform foundation pile driving during daylight hours, defined as no earlier than 1 hour prior to civil sunset or later than 1.5 hours prior to civil sunrise, and may only continue pile driving into darkness

if stopping operations represents a risk to human health, safety, and/or pile stability, unless the LOA Holder submits, and NMFS approves, an Alternative Monitoring Plan, which would allow pile driving to begin after daylight hours have ended. Until this is submitted, reviewed, and approved by NMFS, LOA Holder may not begin any new pile driving outside of the daylight hours previously defined in this subsection;

(5) Soft-start must occur at the beginning of impact driving and at any time following a cessation of impact pile driving of 30 minutes or longer;

(6) Monitoring of the clearance zones must begin 60 minutes immediately prior to initiation of pile driving. The shutdown zones must be monitored during all pile driving. If a marine mammal is detected within or about to enter the applicable clearance zones 30 minutes prior to the beginning of pile driving (including soft-start if impact pile driving) or during pile driving, pile driving must be delayed or shutdown until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings. The specific time periods are 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other species;

(7) For North Atlantic right whales, any visual observation by a PSO or acoustic detection within 10 km (6.21 mi) must trigger a delay to the commencement of pile driving. Pile driving may only commence if no North Atlantic right whale visual or acoustic detections have occurred within the clearance zones during the 60-minute monitoring period;

(8) LOA Holder must deploy at least two fully functional noise abatement systems during all foundation pile driving;

(i) A single bubble curtain must not be used;

(ii) Any bubble curtain(s) must distribute air bubbles using an air flow rate of at least $0.5 \text{ m}^3/(\text{minute} \cdot \text{m})$. The bubble curtain(s) must surround 100 percent of the piling perimeter throughout the full depth of the water column. In the unforeseen event of a single compressor malfunction, the offshore personnel operating the bubble curtain(s) must adjust the air supply and operating pressure such that the maximum possible sound attenuation performance of the bubble curtain(s) is achieved;

(iii) The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring

must ensure 100-percent seafloor contact;

(iv) No parts of the ring or other objects may prevent full seafloor contact with a bubble curtain ring;

(v) A full maintenance check (e.g., manually clearing holes) must occur prior to each pile being installed;

(vi) LOA Holder must inspect and carry out appropriate maintenance on the noise attenuation system prior to every pile driving event and prepare and submit a Noise Attenuation System (NAS) inspection/performance report. For piles for which thorough SFV is carried out, this report must be submitted as soon as it is available, but no later than when the interim SFV report is submitted for the respective pile. Performance reports for piles monitoring with abbreviated SFV must be submitted with the weekly pile driving reports;

(vii) Corrections to the bubble ring(s) to meet the performance standards in paragraph (c)(9) of this section must occur prior to impact pile driving of foundation piles; and

(viii) For any noise mitigation device used in addition to the double bubble curtain, LOA Holder must inspect and carry out maintenance on the system and ensure the system is functioning properly prior to every pile driving event.

(9) LOA Holder must utilize PAM systems, as described in a NMFS-approved PAM Plan. The PAM system components (i.e., acoustic buoys) must not be placed closer than 1 km (0.6 mi) to the pile being driven so that the activities do not mask the PAM system. LOA Holder must demonstrate and prove the detection range of the system they plan to deploy while considering potential masking from pile-driving and vessel noise. The PAM system must be able to:

(i) Detect all marine mammals;

(ii) Maximize baleen whale detections; and

(iii) Must be capable of detecting North Atlantic right whales at 10 km (6.21 mi).

(10) Concurrently, LOA Holder must utilize PSO(s) and PAM operator(s), as described in § 217.305(c). PAM operators must be deployed and monitoring for marine mammals in accordance with a NMFS-approved PAM Plan. If a marine mammal is detected (visually or acoustically entering or within the respective shutdown zone after pile driving has begun, the PSO must call for a shutdown of pile driving and LOA Holder must stop pile driving immediately. If pile driving is not shut down due to a safety or pile instability/

refusal situation, LOA Holder must reduce hammer energy to the lowest level practicable and the reason(s) for not shutting down must be documented and reported to NMFS Office of Protected Resources within the applicable monitoring reports (e.g., weekly, monthly);

(11) If a marine mammal is detected (visually or acoustically) entering or within the respective shutdown zone after pile driving has begun, the PSO must call for a shutdown of pile driving and LOA Holder must stop pile driving immediately. If pile driving is not shut down due to a safety or pile instability/refusal situation, LOA Holder must reduce hammer energy to the lowest level practicable and the reason(s) for not shutting down must be documented and reported to NMFS Office of Protected Resources within the applicable monitoring reports (e.g., weekly, monthly) (see § 217.305(g));

(12) A visual observation at any distance from a PSO or an acoustic detection of a North Atlantic right whale within the 10 km (6.21 mi) PAM Clearance/Shutdown Zone triggers shutdown requirements under paragraph (c)(11) of this section. If pile driving has been shut down due to the presence of a North Atlantic right whale, pile driving may not restart until the North Atlantic right whale has neither been visually nor acoustically detected for 30 minutes;

(13) If pile driving has been shut down due to the presence of a marine mammal other than a North Atlantic right whale, pile driving must not restart until either the marine mammal(s) has voluntarily left the specific clearance zones and has been visually or acoustically confirmed beyond that clearance zone, or when specific time periods have elapsed with no further sightings or acoustic detections have occurred. The specific time periods are 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other marine mammal species. In cases where these criteria are not met, pile driving may restart only if necessary to maintain pile stability or avoid refusal, during which time LOA Holder must use the lowest hammer energy practicable;

(14) LOA Holder must conduct thorough sound field verification (hereafter, "SFV") measurements during pile driving activities associated with the installation of, at minimum, the first three monopile foundations installed each calendar year and the first three jacket foundations (inclusive of all pin piles installed for a given jacket foundation). For all thorough SFV, measurements must continue until at least three monopiles and three jacket

foundations demonstrate distances to harassment thresholds are at or below those modeled, assuming 10 decibels (hereafter, “dB”) of attenuation. Subsequent thorough SFV measurements are also required should larger piles be installed or if additional foundations are driven that may produce louder sound fields than those previously measured (e.g., higher hammer energy, greater number of strikes, etc.). All thorough SFV measurements must be conducted as follows:

(i) Measurements must be made at a minimum of four distances from the foundation(s) being driven, along a single transect, in the direction of lowest transmission loss, including, but not limited to, 750 m (2,460 ft) and three additional ranges, including, at least, the applicable modeled Level B harassment isopleth, assuming 10 dB attenuation. At least one additional measurement at an azimuth 90 degrees from the array at 750 m (2,460 ft) must be made. At each location, there must be a near bottom and mid-water column hydrophone;

(ii) The recordings must be continuous throughout the duration of all pile driving of each pile for a given foundation;

(iii) The SFV measurement systems must have a sensitivity appropriate for the expected sound levels from pile driving received at the nominal ranges throughout the installation of the pile(s). The frequency range of SFV measurement systems must cover the range of at least 20 hertz (hereafter, “Hz”) to 20 kilohertz (hereafter, “kHz”). The SFV measurement systems must be designed to have omnidirectional sensitivity so that the broadband received level of all pile driving exceeds the system noise floor by at least 10 dB. The dynamic range of the SFV measurement system must be sufficient such that, at each piling location, the signals must avoid poor signal-to-noise ratios for low amplitude signals and avoid clipping, nonlinearity, and saturation for high amplitude signals;

(iv) All hydrophones used in SFV measurements systems are required to have undergone a full system, traceable laboratory calibration conforming to International Electrotechnical Commission (hereafter, “IEC”) 60565, or an equivalent standard procedure, from a factory or accredited source to ensure the hydrophone receives accurate sound levels, at a date not to exceed 2 years before deployment. Additional *in-situ* calibration checks using a pistonphone are required to be performed before and after each hydrophone deployment. If the measurement system employs filters

via hardware or software (e.g., high-pass, low-pass, etc.), which are not already accounted for by the calibration, the filter performance (i.e., the filter’s frequency response) must be known, reported, and the data corrected before analysis;

(v) LOA Holder must be prepared with additional equipment (e.g., hydrophones, recording devices, hydrophone calibrators, cables, batteries, etc.), which exceeds the amount of equipment necessary to perform the measurements, such that technical issues can be mitigated before measurement; and

(vi) LOA Holder must submit interim thorough SFV reports within 48 hours after each foundation is measured (see § 217.305(g) for interim reporting requirements).

(15) For thorough SFV on monopile and jacket foundations:

(i) If any of the thorough SFV measurements from any foundation (monopile or jacket) indicate the distances to NMFS’ marine mammal Level A harassment or Level B harassment thresholds, assuming 10-dB attenuation, are greater than those modeled, before the next foundation is installed, LOA Holder must identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances on subsequent foundations; provide a written explanation to NMFS Office of Protected Resources supporting that determination and requesting concurrence to proceed; and, following NMFS Office of Protected Resource’s concurrence, deploy those additional measure or modifications on any subsequent foundation that are installed;

(A) LOA Holder must also increase clearance and shutdown zone sizes to those identified by NMFS Office of Protected Resources. For every 1,500 m (4,921.3 ft) that a marine mammal clearance or shutdown zone is expanded, additional PSOs must be deployed from additional platforms/vessels to ensure adequate and complete monitoring of the expanded shutdown and/or clearance zone;

(B) Following installation of the foundation with additional, alternative, or modified noise attenuation measures/operational changes, SFV must be conducted on two additional foundations. If the SFV results from all three of those foundations are within the distances to isopleths of concern modeled assuming 10 dB attenuation, LOA Holder must continue to

implement the approved additional, alternative, or modified sound attenuation measures/operational changes;

(C) If, after all practicable measures that could be taken to reduce noise levels have been successfully implemented and exhausted, thorough SFV measurements continue to indicate that the distances to the marine mammal harassment thresholds are greater than those modeled assuming 10 dB attenuation, LOA Holder must consult with NMFS Office of Protected Resources to evaluate the circumstances before additional piles are installed; and

(ii) If, through SFV indicate that ranges to isopleths corresponding to the Level A harassment and/or Level B harassment thresholds are less than those predicted by modeling (assuming 10-dB attenuation), LOA Holder may request a modification of the minimum visibility, clearance, and shutdown zones from NMFS Office of Protected Resources. For NMFS Office of Protected Resources to consider a modification request for reduced zone sizes, LOA Holder must have conducted thorough SFV measurements on three foundations and ensure that subsequent foundations would be installed under conditions that are predicted to produce smaller harassment zones than those modeled assuming 10-dB of attenuation, provided LOA Holder continue to implement the approved additional, alternative, or modified sound attenuation measures/operational changes.

(16) LOA Holder must conduct abbreviated SFV monitoring, consisting of a single acoustic recorder with a bottom and midwater hydrophone, placed at an appropriate distance from each pile driven foundation installations, on all foundations for which thorough SFV monitoring, as described in paragraph (c)(15) of this section, is not performed. Results of abbreviated SFV monitoring must be included in the weekly pile driving reports;

(i) Abbreviated SFV monitoring duration and equipment must comply with the conditions specified in paragraphs (c)(14)(ii) through (v) of this section; and

(ii) If the results of abbreviated SFV monitoring indicate that distances to the identified Level A and Level B harassment thresholds for marine mammals may have been exceeded during the pile driving event, LOA Holder must notify NMFS Office of Protected Resources as soon as possible after receiving such results, and include an explanation of suspected or identified factors that contributed to the

potential exceedance and corrective actions that were taken, or planned to be taken, to avoid potential exceedance on subsequent piles. Additional actions may include: adjustments or additions to the noise attenuation system or pile driving operations and/or additional thorough SFV monitoring.

(17) LOA Holder must conduct SFV measurements during turbine operations to estimate turbine operational source levels and transmission loss rates in accordance with an NMFS-approved SFV Plan;

(18) LOA Holder must submit a SFV Plan to NMFS Office of Protected Resources for review and approval at least 180 calendar days prior to planned start of foundation installation activities and abide by the SFV Plan, if approved. At minimum, the SFV Plan must describe how thorough and abbreviated SFV would be conducted, and if the first three monopile foundation/first three entire jacket foundations (inclusive of all pin piles for a given jacket foundation) installation sites selected for thorough SFV measurements are representative of the remainder of the monopile and jacket foundation installation sites or include information in the SFV Plan on which additional sites/scenarios would be selected for thorough SFV measurements. This SFV Plan must also describe approaches that LOA Holder could take to adjust noise attenuation systems or add systems in the case that any SFV measurements obtained demonstrate that noise levels are above those modeled (assuming 10 dB of attenuation). Prior to operations for each Project, the SFV Plan must also include how operational noise would be monitored. Operational parameters (*e.g.*, direct drive information, turbine rotation rate) as well as sea state conditions and information on nearby anthropogenic activities (*e.g.*, vessels transiting or operating in the area) must be reported. Additionally, the SFV Plan must also include methodology for collecting, analyzing, and preparing thorough and abbreviated SFV measurement data for submission to NMFS Office of Protected Resources and describe how the effectiveness of the sound attenuation methodology would be evaluated based on the results. Pile driving may not occur until NMFS approves the SFV Plan;

(19) LOA Holder must submit a Foundation Installation Pile Driving Marine Mammal Monitoring Plan to NMFS Office of Protected Resources for review and approval at least 180 calendar days prior to planned start of foundation pile driving and abide by the Foundation Installation Pile Driving Marine Mammal Monitoring Plan if

approved. LOA Holder must obtain both NMFS Office of Protected Resources and NMFS Greater Atlantic Regional Fisheries Office Protected Resources Division's concurrence with this Plan prior to the start of any pile driving. The Plan must include, but is not limited to, the following: the final pile driving Project design (*e.g.*, number and type of piles, hammer type, noise abatement systems, anticipated start date, *etc.*) and a description of all monitoring equipment and PAM operator and PSO protocols (including number and location of PSOs and PAM operators) for all foundation pile driving. No foundation pile installation can occur without NMFS' approval of the Foundation Installation Pile Driving Marine Mammal Monitoring Plan. More information on what this Plan must include can be found in the LOA; and

(20) LOA Holder must submit a Passive Acoustic Monitoring Plan (hereafter, "PAM Plan") to NMFS Office of Protected Resources for review and approval at least 180 calendar days prior to the planned start of foundation installation activities and abide by the PAM Plan, if approved. The PAM Plan must include a description of all proposed PAM equipment, address how the proposed passive acoustic monitoring must follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind. The PAM Plan must describe all proposed PAM equipment, procedures, and protocols including proof that vocalizing North Atlantic right whales will be detected within the clearance and shutdown zones. No pile installation can occur if LOA Holder's PAM Plan does not receive approval from NMFS Office of Protected Resources and NMFS Greater Atlantic Regional Fisheries Office Protected Resources Division.

(d) *Cofferdam installation and removal.* The following requirements apply to the installation and removal of cofferdams at the cable landfall construction sites:

(1) Installation of cofferdams must not occur during nighttime hours (defined as the hours between 1.5 hours prior to civil sunset and 1 hour after civil sunrise);

(2) LOA Holder must establish and implement clearance zones for the installation and removal of cofferdams using visual monitoring. These zones must be measured using the radial distance from the cofferdam being installed and/or removed;

(3) LOA Holder must utilize PSO(s), as described in § 217.305(d). At least two on-duty PSOs must monitor for marine mammals at least 30 minutes

before, during, and 30 minutes after vibratory pile driving associated with cofferdam installation;

(4) If a marine mammal(s) is observed entering or is observed within the clearance zones, before vibratory pile driving has begun, the activity must not commence until the animal(s) has exited the zone or a specific amount of time has elapsed since the last sighting. The specific time periods are 15 minutes for small odontocetes and pinnipeds and 30 minutes for all other marine mammal species;

(5) If a marine mammal is observed entering or within the respective shutdown zone after vibratory pile driving has begun, the PSO must call for a shutdown of vibratory pile driving. LOA Holder must stop pile driving immediately unless shutdown is not practicable due to imminent risk of injury or loss of life to an individual or if there is a risk of damage to the vessel that would create a risk of injury or loss of life for individuals or if the lead engineer determines there is refusal or instability. In any of these situations, LOA Holder must document the reason(s) for not shutting down and report the information to NMFS Office of Protected Resources in the annual report (as described in § 217.305(h)). In cases where shutdown is not feasible, pile driving may restart only if necessary to maintain pile stability at which time LOA Holder must use the lowest energy practicable to maintain stability; and

(6) Vibratory pile driving must not restart until either the marine mammal(s) has voluntarily left the specific clearance zones and has been visually confirmed beyond that clearance zone or when specific time periods have elapsed with no further sightings or acoustic detections have occurred. The specific time periods are 15 minutes for small odontocetes and pinnipeds and 30 minutes for all other marine mammal species.

(e) *HRG surveys.* The following requirements apply to HRG surveys operating sub-bottom profilers (hereinafter, "acoustic sources") (*i.e.*, sparkers and Compressed High Intensity Radiated Pulse (CHIRPs)):

(1) LOA Holder must establish and implement clearance and shutdown zones for HRG surveys using visual monitoring, as described in paragraph (c) of this section;

(2) LOA Holder must utilize PSO(s), as described in § 217.305(e);

(3) LOA Holder must abide by the relevant Project Design Criteria (hereafter, "PDCs"; specifically, PDCs 4, 5, and 7) of the programmatic consultation completed by NMFS'

Greater Atlantic Regional Fisheries Office on June 29, 2021 (revised September 2021), pursuant to section 7 of the Endangered Species Act (hereafter, "ESA"). To the extent that any relevant Best Management Practices (hereafter, "BMPs") described in these PDCs are more stringent than the requirements herein, those BMPs supersede these requirements and must be implemented;

(4) Acoustic sources must be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Acoustic sources must be used at the lowest practicable source level to meet the survey objective, when in use, and must be turned off when they are not necessary for the survey;

(5) Prior to starting the survey and after receiving confirmation from the PSOs that the clearance zone is clear of any marine mammals, LOA Holder is required to ramp-up acoustic sources to half power for 5 minutes prior to commencing full power, unless the equipment operates on a binary on/off switch (in which case ramp-up is not required). LOA Holder must also ensure visual clearance zones are fully visible (e.g., not obscured by darkness, rain, fog, etc.) and clear of marine mammals, as determined by the Lead PSO, for at least 30 minutes immediately prior to the initiation of survey activities using acoustic sources;

(6) Ramp-up and activation must be delayed if a marine mammal(s) enters its respective shutdown zone. Ramp-up and activation may only be reinitiated if the animal(s) has been observed exiting its respective shutdown zone or until 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other species, has elapsed with no further sightings;

(7) Prior to a ramp-up procedure starting or activating acoustic sources, the acoustic source operator (operator) must notify a designated PSO of the planned start of ramp-up as agreed upon with the Lead PSO. The notification time should not be less than 60 minutes prior to the planned ramp-up or activation in order to allow the PSOs time to monitor the clearance zone(s) for 30 minutes prior to the initiation of ramp-up or activation (pre-start clearance). During this 30-minute pre-start clearance period, the entire applicable clearance zones must be visible, except as indicated in paragraph (f)(12) of this section;

(8) Ramp-ups must be scheduled so as to minimize the time spent with the source activated;

(9) A PSO conducting pre-start clearance observations must be notified

again immediately prior to reinitiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed;

(10) LOA Holder must implement a 30-minute clearance period of the clearance zones immediately prior to the commencing of the survey or when there is more than a 30-minute break in survey activities or PSO monitoring. A clearance period is a period when no marine mammals are detected in the relevant zone;

(11) If a marine mammal is observed within a clearance zone during the clearance period, ramp-up and acoustic surveys may not begin until the animal(s) has been observed voluntarily exiting its respective clearance zone or until a specific time period has elapsed with no further sighting. The specific time period is 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other species;

(12) In any case when the clearance process has begun in conditions with good visibility, including via the use of night vision equipment (i.e., infrared (IR)/thermal camera), and the Lead PSO has determined that the clearance zones are clear of marine mammals, survey operations may commence (i.e., no delay is required) despite periods of inclement weather and/or loss of daylight. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of marine mammals in the 30 minutes prior to beginning ramp-up;

(13) Once the survey has commenced, LOA Holder must shut down acoustic sources if a marine mammal enters a respective shutdown zone, except in cases when the shutdown zones become obscured for brief periods due to inclement weather, survey operations may continue (i.e., no shutdown is required) so long as no marine mammals have been detected. The shutdown requirement does not apply to small delphinids of the following genera: *Delphinus*, *Stenella*, *Lagenorhynchus*, and *Tursiops*. If there is uncertainty regarding the identification of a marine mammal species (i.e., whether the observed marine mammal belongs to one of the delphinid genera for which shutdown is waived), the PSOs must use their best professional judgment in making the decision to call for a shutdown. Shutdown is required if a delphinid that belongs to a genus other than those specified in paragraph (e)(13) of this section is detected in the shutdown zone;

(14) If an acoustic source has been shut down due to the presence of a marine mammal, the use of an acoustic

source may not commence or resume until the animal(s) has been confirmed to have left the Level B harassment zone or until a full 15 minutes (for small odontocetes and seals) or 30 minutes (for all other marine mammals) have elapsed with no further sighting; and

(15) If an acoustic source is shut down for a period longer than 30 minutes, all clearance and ramp-up procedures must be initiated. If an acoustic source is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, acoustic sources may be activated again without ramp-up only if PSOs have maintained constant observation and no additional detections of any marine mammal occurred within the respective shutdown zones.

(f) *Fisheries monitoring surveys.* The following measures apply to fishery monitoring surveys:

(1) All captains and crew conducting fishery surveys must be trained in marine mammal detection and identification. Marine mammal monitoring will be conducted by the captain and/or a member of the scientific crew within 1 nautical mile (nmi) (1.85 km; 1.2 mi) and 15 minutes prior to deploying gear), during, and for 15 minutes after haul back;

(2) Survey gear must be deployed as soon as possible once the vessel arrives on station. Gear must not be deployed if there is a risk of interaction with marine mammals. Gear may be deployed after 15 minutes of no marine mammal sightings within 1 nmi (1,852 m) of the sampling station;

(3) LOA Holder and/or its cooperating partners, contracted vessels, or commercially hired captains must implement the following "move-on" rule: if marine mammals are sighted within 1 nmi (1.2 mi) of the planned location and 15 minutes before gear deployment, then LOA Holder and/or its cooperating partners, contracted vessels, or commercially hired captains, as appropriate, must move the vessel away from the marine mammal to a different section of the sampling area. If, after moving on, marine mammals are still visible from the vessel, LOA Holder and its cooperating partners, contracted vessels, or commercially hired captains must move again or skip the station;

(4) If a marine mammal is at risk of interacting with deployed gear, all gear must be immediately removed from the water. If marine mammals are sighted before the gear is fully removed from the water, LOA Holder must take the most appropriate action to avoid marine mammal interaction and the vessel must slow its speed and maneuver the vessel away from the animals to minimize

potential interactions with the observed animal;

(5) Unless using ropeless gear, LOA Holder must maintain visual marine mammal monitoring effort during the entire period of time that gear is in the water (*i.e.*, throughout gear deployment, fishing, and retrieval);

(6) All fisheries monitoring gear must be fully cleaned and repaired (if damaged) before each use/deployment;

(7) LOA Holder's fixed gear must comply with the Atlantic Large Whale Take Reduction Plan regulations at 50 CFR 229.32 during fisheries monitoring surveys;

(8) Trawl tows must be limited to a maximum of a 20-minute trawl time at 3.0 kn (3.45 mph);

(9) All gear must be emptied as close to the deck/sorting area and as quickly as possible after retrieval;

(10) During trawl surveys, vessel crew must open the codend of the trawl net close to the deck in order to avoid injury to animals that may be caught in the gear;

(11) All fishery survey-related lines must include the breaking strength of all lines being less than 1,700 pounds (lbs) (771 kilograms (kg)). This may be accomplished by using whole buoy line that has a breaking strength of 1,700 lbs (771 kg); or buoy line with weak inserts that result in line having an overall breaking strength of 1,700 lbs (771 kg);

(12) During any survey that uses vertical lines, buoy lines must be weighted and must not float at the surface of the water and all groundlines must be composed entirely of sinking lines. Buoy lines must utilize weak links. Weak links must break cleanly leaving behind the bitter end of the line. The bitter end of the line must be free of any knots when the weak link breaks. Splices are not considered to be knots. The attachment of buoys, toggles, or other floatation devices to groundlines is prohibited;

(13) All in-water survey gear, including buoys, must be properly labeled with the scientific permit number or identification as LOA Holder's research gear. All labels and markings on the gear, buoys, and buoy lines must also be compliant with the applicable regulations, and all buoy markings must comply with instructions received by the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division;

(14) All survey gear must be removed from the water whenever not in active survey use (*i.e.*, no wet storage);

(15) All reasonable efforts, that do not compromise human safety, must be undertaken to recover gear; and

(16) All lost gear associated with the fishery surveys must be reported to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division (*nmfs.gar.incidental-take@noaa.gov*) within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.

§ 217.305 Monitoring and reporting requirements.

(a) *Protected species observer (PSO) and passive acoustic monitoring (PAM) operator qualifications.* LOA Holder must implement the following measures applicable to PSOs and PAM operators:

(1) LOA Holder must use independent, NMFS-approved PSOs and PAM operators (*i.e.*, the PSOs and PAM operators must be employed by a third-party observer provider) must have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant crew with regard to the presence of protected species and mitigation requirements;

(2) All PSOs and PAM operators must have successfully attained a bachelor's degree in one of the natural sciences. The educational requirements may be waived if the PSO or PAM operator has acquired the relevant skills through a suitable amount of alternate experience. Requests for such a waiver must be submitted to NMFS Office of Protected Resources and must include written justification containing alternative experience. Alternate experiences that may be considered include but are not limited to: previous work experience conducting academic, commercial, or government-sponsored marine mammal visual and/or acoustic surveys; or previous work experience as a PSO/PAM operator. All PSOs and PAM operators should demonstrate good standing and consistently good performance of all assigned duties;

(3) PSOs must have visual acuity in both eyes (with correction of vision being permissible) sufficient enough to discern moving targets on the water's surface with the ability to estimate the target size and distance (binocular use is allowable); ability to conduct field observations and collect data according to the assigned protocols; sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; writing skills sufficient to document observations, including but not limited to, the number and species of marine mammals observed, the dates and times of when in-water construction activities

were conducted, the dates and time when in-water construction activities were suspended to avoid potential incidental take of marine mammals from construction noise within a defined shutdown zone, and marine mammal behavior; and the ability to communicate orally, by radio, or in-person, with Project personnel to provide real-time information on marine mammals observed in the area;

(4) All PSOs must be trained in northwestern Atlantic Ocean marine mammal identification and behaviors and must be able to conduct field observations and collect data according to assigned protocols. Additionally, PSOs must have the ability to work with all required and relevant software and equipment necessary during observations (as described in paragraphs (b)(5) and (6) of this section);

(5) All PSOs and PAM operators must successfully complete a relevant training course within the last 5 years, including obtaining a certificate of course completion;

(6) PSOs are responsible for obtaining NMFS' approval. NMFS may approve PSOs as conditional or unconditional. A conditionally approved PSO may be one who has completed training in the last 5 years but has not yet attained the requisite field experience. An unconditionally approved PSO is one who has completed training within the last 5 years and attained the necessary experience (*i.e.*, demonstrate experience with monitoring for marine mammals at clearance and shutdown zone sizes similar to those produced during the respective activity);

(7) At least one PSO for each activity (*e.g.*, foundation installation, cable landfall construction, and HRG surveys) on each vessel must be designated as the Lead PSO. The Lead PSO must meet the minimum requirements described in paragraphs (a)(2) through (5) of this section and have a minimum of 90 days of at-sea experience visually monitoring marine mammals, including baleen whales, and no more than 18 months may have elapsed since the conclusion of their last at-sea experience;

(8) PSOs for cable landfall construction (*i.e.*, vibratory pile installation and removal) and HRG surveys may be unconditionally or conditionally approved. A conditionally approved PSO must be paired with an unconditionally approved PSO. PSOs for foundation installation must be unconditionally approved;

(9) PAM operators are responsible for obtaining NMFS approval. To be approved as a PAM operator, the person must meet the following qualifications. The PAM operator must: demonstrate

that they have prior experience with relevant acoustic software and equipment and real-time acoustic detection systems and/or have completed specialized training for operating PAM systems and detecting and identifying Atlantic Ocean marine mammals sounds, in particular: North Atlantic right whale sounds, humpback whale sounds, and how to deconflict them from similar North Atlantic right whale sounds, and other co-occurring species' sounds in the area including sperm whales; be able to distinguish between whether a marine mammal or other species sound is detected, possibly detected, or not detected; be able to review and classify acoustic detections in real-time (prioritizing North Atlantic right whales and noting detection of other cetaceans) during the real-time monitoring periods where localization of sounds or deriving bearings and distance are possible and demonstrate experience in using this technique; have the qualifications and relevant experience/training to safely deploy and retrieve equipment and program the software, as necessary; and must be able to test software and hardware functionality prior to operation;

(10) LOA Holder must submit previously approved PSOs and PAM operators to NMFS Office of Protected Resources for review and confirmation of their approval for specific roles at least 30 business days prior to commencement of the activities requiring PSOs/PAM operators or 15 business days prior to when new PSOs/PAM operators are required after activities have commenced;

(11) For prospective PSOs and PAM operators not previously approved, or for PSOs and PAM operators whose approval is not current, LOA Holder must submit resumes for approval at least 60 business days prior to PSO and PAM operator use. Resumes must include information related to relevant education, experience, and training, including dates, duration, location, and description of prior PSO or PAM operator experience. Resumes must be accompanied by relevant documentation of successful completion of necessary training;

(12) PSOs may work as PAM operators and vice versa, pending NMFS-approval; however, they may only perform one role at any single time and must not exceed work time restrictions, which must be tallied cumulatively; and

(13) All PSOs and PAM operators must complete a Permits and Environmental Compliance Plan training and a 2-day refresher session

that must be held with the PSO/PAM operator provider and Project compliance representative(s) prior to the start of in-water Project activities requiring PSOs and PAM operators.

(b) *General PSO and PAM operator requirements.* The following measures apply to PSOs and PAM operators and must be implemented by LOA Holder:

(1) PSOs must monitor for marine mammals prior to, during, and following all impact pile driving, vibratory pile driving, and HRG surveys that use sub-bottom profilers (with specific monitoring durations and needs described in paragraphs (c) through (f) of this section, respectively). Monitoring must be done while free from distractions and in a consistent, systematic, and diligent manner;

(2) All PSOs must be located at the best vantage point(s) on any platform, as determined by the Lead PSO. PAM operators may be located on a vessel or remotely on-shore, but must have the appropriate equipment (*i.e.*, computer station equipped with a data collection software system and acoustic data analysis software) available wherever they are stationed, and data or data products must be streamed in real-time or in near real-time;

(3) All on-duty PSOs must remain in real-time contact with the on-duty PAM operator(s). PAM operator(s) must immediately communicate all acoustic detections of marine mammals to PSOs, including any determination regarding species identification, distance, and bearing (where relevant) relative to the pile being driven and the degree of confidence (*e.g.*, possible, probable detection) in the determination. All on-duty PSOs and PAM operator(s) must remain in contact with the on-duty construction personnel responsible for implementing mitigations (*e.g.*, delay to pile driving) to ensure communication on marine mammal observations can easily, quickly, and consistently occur between all on-duty PSOs, PAM operator(s), and on-water Project personnel;

(4) The PAM operator must inform the Lead PSO(s) on duty of animal detections, including any determination regarding species identification, distance, bearing, and degree of confidence in the determinations, approaching or within applicable ranges of interest to the activity occurring via the data collection software system, (*e.g.*, *Mysticetus* or similar system) who must be responsible for requesting that the designated crewmember implement the necessary mitigation procedures (*i.e.*, delay);

(5) PSOs must use high magnification (25x) binoculars, standard handheld

(7x) binoculars, and the naked eye to search continuously for marine mammals. During foundation installation, at least two PSOs on the pile driving-dedicated PSO vessel(s) must be equipped with functional Big Eye binoculars (*e.g.*, 25 × 150; 2.7 view angle; individual ocular focus; height control); these must be pedestal mounted on the deck at the best vantage point that provides for optimal sea surface observation and PSO safety;

(6) During periods of low visibility (*e.g.*, darkness, rain, fog, poor weather conditions, *etc.*), PSOs must use alternative technology (*i.e.*, infrared or thermal cameras) to monitor the clearance and shutdown zones as approved by NMFS;

(7) PSOs and PAM operators must not exceed 4 consecutive watch hours on duty at any time, must have a 2-hour (minimum) break between watches, and must not exceed a combined watch schedule of more than 12 hours in a 24-hour period. If the schedule includes PSOs and PAM operators on-duty for 2-hour shifts, a minimum 1-hour break between watches must be allowed; and

(8) During daylight hours when equipment is not operating, LOA Holder must ensure that visual PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-effort PSO monitoring must be reflected in the monthly PSO monitoring reports.

(c) *PSO and PAM operator requirements during WTG, OSS, and Met Tower foundation installation.* The following measures apply to PSOs and PAM operators during WTG, OSS, and Met Tower foundation installation and must be implemented by LOA Holder:

(1) At least three on-duty PSOs must be stationed and observing from the pile driving activity platform. Additionally, LOA Holder must use two dedicated-PSO vessels and each vessel must have at least three PSOs on duty. LOA Holder may request NMFS approval to use alternative technology *in lieu* of one or two of the dedicated PSO vessels that provide similar marine mammal detection capabilities. If NMFS approves the use of alternative technology *in lieu* of the additional PSO vessels, LOA Holder must abide by any conditions of approved, as specified by NMFS;

(2) PSOs and PAM operator(s), using a NMFS-approved PAM system, must monitor for marine mammals 60 minutes prior to, during, and 30 minutes following all pile-driving. If PSOs cannot visually monitor the minimum visibility zone for the 60 minutes prior to and during pile

driving, pile-driving operations must not commence or must shutdown if they are currently active; and

(3) LOA Holder must conduct PAM for at least 24 hours prior to pile driving activities. The PAM operator(s) must review all detections from the previous 24-hour period prior to starting foundation pile driving.

(d) *PSO requirements during cable landfall construction.* The following measures apply to PSOs during cofferdam installation and removal and must be implemented by LOA Holder:

(1) At least two PSOs must be on active duty during all activities related to the installation and removal of cofferdams; and

(2) PSOs must monitor the clearance zone for the presence of marine mammals for 30 minutes before, throughout the installation of the sheet piles, and for 30 minutes after all vibratory pile driving activities have ceased. Sheet pile installation and removal must only commence when visual clearance zones are fully visible (*e.g.*, not obscured by darkness, rain, fog, *etc.*) and clear of marine mammals, as determined by the Lead PSO, for at least 30 minutes immediately prior to the initiation of vibratory pile driving.

(e) *PSO requirements during HRG surveys.* The following measures apply to PSOs during HRG surveys using CHIRPs and sparkers and must be implemented by LOA Holder:

(1) Between four and six PSOs must be present on every 24-hour survey vessel and two to three PSOs must be present on every 12-hour survey vessel;

(2) At least one PSO must be on active duty monitoring 30 minutes before, during, and 30 minutes after HRG surveys conducted during daylight (*i.e.*, from 30 minutes prior to civil sunrise through 30 minutes following civil sunset) and at least two PSOs must be on active duty monitoring 30 minutes before, during, and 30 minutes after HRG surveys conducted at night;

(3) PSOs on HRG vessels must begin monitoring 30 minutes prior to activating acoustic sources, during the use of these acoustic sources, and for 30 minutes after use of these acoustic sources has ceased;

(4) Any observations of marine mammals must be communicated to PSOs on all nearby survey vessels during concurrent HRG surveys; and

(5) During daylight hours when survey equipment is not operating, LOA Holder must ensure that visual PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-

effort PSO monitoring must be reflected in the monthly PSO monitoring reports.

(f) *Monitoring requirements during fisheries monitoring surveys.* The following measures apply during fisheries monitoring surveys and must be implemented by LOA Holder:

(1) All captains and crew conducting fishery surveys must be trained in marine mammal detection and identification; and

(2) Marine mammal monitoring must be conducted within 1 nmi from the planned survey location by the trained captain and/or a member of the scientific crew for 15 minutes prior to deploying gear, throughout gear deployment and use (unless using ropeless gear), and for 15 minutes after haul back.

(g) *Reporting.* LOA Holder must comply with the following reporting measures:

(1) Prior to initiation of any specified activities, LOA Holder must demonstrate, in a report submitted to NMFS Office of Protected Resources, that all required training for LOA Holder personnel (including the vessel crews, vessel captains, PSOs, and PAM operators) has been completed;

(2) LOA Holder must use a standardized reporting system during the effective period of the LOA. All data collected related to the Project must be recorded using industry-standard software that is installed on field laptops and/or tablets. Unless stated otherwise, all reports must be submitted to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov), dates must be in MM/DD/YYYY format, and location information must be provided in Decimal Degrees with the coordinate system information (*e.g.*, North American Datum of 1983 (NAD83), World Geodetic System 1984 (WGS84), *etc.*);

(3) For all visual monitoring efforts and marine mammal sightings, the following information must be collected and reported to NMFS Office of Protected Resources: the date and time that monitored activity begins or ends; the construction activities occurring during each observation period; the watch status (*i.e.*, sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform); the PSO who sighted the animal; the time of sighting; the weather parameters (*e.g.*, wind speed, percent cloud cover, visibility); the water conditions (*e.g.*, Beaufort sea state, tide state, water depth); all marine mammal sightings, regardless of distance from the activity; species (or lowest possible taxonomic level possible); the pace of the animal(s); the estimated number of animals

(minimum/maximum/high/low/best); the estimated number of animals by cohort (*e.g.*, adults, yearlings, juveniles, calves, group composition, *etc.*); the description (*i.e.*, as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics); the description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling) and observed changes in behavior, including an assessment of behavioral responses thought to have resulted from the specific activity; the animal's closest distance and bearing from the pile being driven or specified HRG equipment and estimated time entered or spent within the Level A harassment and/or Level B harassment zone(s); the activity at time of sighting (*e.g.*, impact pile driving, vibratory pile driving, construction surveys); use of any noise attenuation device(s); and specific phase of activity (*e.g.*, ramp-up of HRG equipment, HRG acoustic source on/off, soft-start for pile driving, active pile driving, *etc.*); the marine mammal occurrence in Level A harassment or Level B harassment zones; the description of any mitigation-related action implemented, or mitigation-related actions called for but not implemented, in response to the sighting (*e.g.*, delay, shutdown, *etc.*) and time and location of the action; other human activity in the area; and other applicable information, as required in any LOA issued under § 217.306;

(4) If a marine mammal is acoustically detected during PAM, the following information must be recorded and reported to NMFS: location of hydrophone (latitude and longitude; in decimal degrees) and site name; bottom depth and depth of recording unit (in meters); recorder (model & manufacturer) and platform type (*i.e.*, bottom-mounted, electric glider, *etc.*), and instrument ID of the hydrophone and recording platform (if applicable); time zone for sound files and recorded date/times in data and metadata (in relation to Universal Coordinated Time (UTC); *i.e.*, Eastern Standard Time (EST) time zone is UTC-5); duration of recordings (start/end dates and times; in International Organization for Standardization (ISO) 8601 format, yyyy-mm-ddTHH:MM:SS.sssZ); deployment/retrieval dates and times (in ISO 8601 format); recording schedule (must be continuous); hydrophone and recorder sensitivity (in dB re. 1 microPascal (μPa)); calibration curve for each recorder; bandwidth/sampling rate (in Hz); sample bit-rate of

recordings; and detection range of equipment for relevant frequency bands (in meters):

(i) For each detection, the following information must be noted: species identification (if possible); call type and number of calls (if known); temporal aspects of vocalization (date, time, duration, *etc.*; date times in ISO 8601 format); confidence of detection (detected, or possibly detected); comparison with any concurrent visual sightings; location and/or directionality of call (if determined) relative to acoustic recorder or construction activities; location of recorder and construction activities at time of call; name and version of detection or sound analysis software used, with protocol reference; minimum and maximum frequencies viewed/monitored/used in detection (in Hz); and name of PAM operator(s) on duty.

(ii) [Reserved]

(5) LOA Holder must compile and submit weekly reports during foundation installation to NMFS Office of Protected Resources that document the daily start and stop of all pile driving associated with the Project; the start and stop of associated observation periods by PSOs and PAM operators; details on the deployment of PSOs and PAM operators; a record of all observations/detections of marine mammals (acoustic and visual); any mitigation actions (or if mitigation actions could not be taken, provide reasons why); details on the noise attenuation system(s) used and its performance; and all abbreviated SFV results, including any indications that distances to the identified Level A harassment and Level B harassment thresholds for marine mammals were exceeded and an explanation of factors that contributed to each exceedance (if found) and corrective actions that were taken to avoid exceedance on subsequent piles. The weekly report must also identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is completed, weekly reports are no longer required by LOA Holder;

(6) LOA Holder must compile and submit monthly reports to NMFS Office of Protected Resources during foundation installation that include a summary of all information in the weekly reports, including Project activities carried out in the previous month, vessel transits (number, type of vessel, MMIS number, and route), number of piles installed, all detections of marine mammals, and any mitigative action taken. The monthly report must also identify which turbines become

operational and when (a map must be provided). Once all foundation pile installation is completed, monthly reports are no longer required by LOA Holder;

(7) LOA Holder must submit a draft annual report to NMFS Office of Protected Resources following completion of activities each year. LOA Holder must provide a final report within 30 calendar days following resolution of NMFS' comments on the draft report. The draft and final reports must detail the following: the total number of marine mammals of each species/stock detected and how many were within the designated Level A harassment and Level B harassment zone(s) with comparison to authorized take of marine mammals for the associated activity type; marine mammal detections and behavioral observations before, during, and after each activity; what mitigation measures were implemented (*i.e.*, number of shutdowns or clearance zone delays, *etc.*) or, if no mitigative actions were taken, why not; operational details (*i.e.*, days and duration of impact and vibratory pile driving, days and amount of HRG survey effort, *etc.*); any PAM systems used; the results, effectiveness, and which noise attenuation systems were used during relevant activities (*i.e.*, foundation impact pile driving); summarized information related to situational reporting; and any other important information relevant to the Project, including additional information that may be identified through the adaptive management process;

(8) LOA Holder must submit its draft 5-year report to NMFS Office of Protected Resources on all visual and acoustic monitoring conducted within 90 calendar days of the completion of activities occurring under the LOA. A 5-year report must be prepared and submitted within 60 calendar days following receipt of any NMFS Office of Protected Resources comments on the draft report. The draft and final 5-year report must include, but is not limited to, the following: the total number (annually and across all 5 years) of marine mammals of each species/stock detected and how many were detected within the designated Level A harassment and Level B harassment zone(s) with comparison to authorized take of marine mammals for the associated activity; summary table(s) indicating the amount of each activity type (*e.g.*, pile installation, HRG) completed in each of the 5 years and total; Environmental Systems Research Institute, Inc. (ESRI) vector Geographic Information System (GIS) shapefile(s) of

the final location of all piles, cable routes, and other permanent structures including an indication of what year it was installed and began operating; ESRI vector GIS shapefile of all North Atlantic right whale sightings, including dates and group sizes; a 5-year summary and evaluation of all SFV data collected; a 5-year summary and evaluation of all PAM data collected; a 5-year summary and evaluation of marine mammal behavioral observations; a 5-year summary and evaluation of mitigation and monitoring implementation and effectiveness; and a list of recommendations to inform environmental compliance assessments for future offshore wind actions;

(9) LOA Holder must provide the initial results of the thorough SFV measurements (see § 217.304(c)(15)) to NMFS Office of Protected Resources in an interim report after each foundation installation event as soon as they are available and prior to any subsequent foundation installation, but no later than 48 hours after each completed foundation installation event. The report must include, at minimum: hammer energies and schedule used during pile driving, including the total number of strikes and the maximum hammer energy; the model-estimated acoustic ranges ($R_{95\%}$) to compare with the real-world sound field measurements; peak sound pressure level (SPL_{pk}), root-mean-square sound pressure level that contains 90 percent of the acoustic energy (SPL_{rms}), and sound exposure level (SEL_L , in single strike for pile driving, SEL_{ss}), for each hydrophone, including at least the maximum, arithmetic mean, minimum, median (L_{50}) and L_5 (95 percent exceedance) statistics for each metric; estimated marine mammal Level A harassment and Level B harassment acoustic isopleths, calculated using the maximum-over-depth L_5 (95 percent exceedance level, maximum of both hydrophones) of the associated sound metric; comparison of modeled results assuming 10-dB attenuation against the measured marine mammal Level A harassment and Level B harassment acoustic isopleths; estimated transmission loss coefficients; pile identifier name, location of the pile and each hydrophone array in latitude/longitude; depths of each hydrophone; one-third-octave band single strike SEL spectra; full filter characteristics (if filtering is applied); and hydrophone specifications including the type, model, and sensitivity. LOA Holder must also report any immediate observations which are suspected to have a significant impact on the results

including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, and technical issues with hydrophones or recording devices. If any *in-situ* calibration checks for hydrophones reveal a calibration drift greater than 0.75 dB, pistonphone calibration checks are inconclusive, or calibration checks are otherwise not effectively performed, LOA Holder must indicate full details of the calibration procedure, results, and any associated issues in the 48-hour interim reports;

(10) LOA Holder must conduct abbreviated SFV for all foundation installations for which the thorough SFV monitoring is not carried out, whereas a single acoustic recorder must be placed at an appropriate distance from the pile. All results must be included in the weekly reports. Any indications that distances to the identified Level A harassment and Level B harassment thresholds for marine mammals were exceeded must be addressed by LOA Holder, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles;

(11) The final results of all SFV measurements from all foundation installations must be submitted no later than 90 calendar days following completion of all annual SFV measurements. The final reports must include all details included in the interim report and descriptions of any notable occurrences, explanations for results that were not anticipated, or actions taken during foundation installation. The final report must also include at least the maximum, mean, minimum, median (L_{50}) and L_5 (95 percent exceedance) statistics for each metric; the SEL and SPL power spectral density and/or one-third octave band levels (usually calculated as decade band levels) at the receiver locations should be reported; range of transmission loss coefficients; the local environmental conditions, such as wind speed, transmission loss data collected on-site (or the sound velocity profile); baseline pre-activity and post-activity ambient sound levels (broadband and/or within frequencies of concern); a description of depth and sediment type, as documented in the Construction and Operation Plan (COP), at the recording and foundation installation locations; the extents of the measured Level A harassment and Level B harassment zone(s); hammer energies required for pile installation and the number of strikes per pile; the hydrophone equipment and methods (*i.e.*, recording device, bandwidth/sampling rate;

distance from the pile where recordings were made); the depth of recording device(s); a description of the SFV measurement hardware and software, including software version used, calibration data, bandwidth capability and sensitivity of hydrophone(s), any filters used in hardware or software, any limitations with the equipment, and other relevant information; the spatial configuration of the noise attenuation device(s) relative to the pile; a description of the noise abatement system and operational parameters (*e.g.*, bubble flow rate, distance deployed from the pile, *etc.*), and any action taken to adjust the noise abatement system. A discussion which includes any observations which are suspected to have a significant impact on the results including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, and technical issues with hydrophones or recording devices;

(12) If at any time during the Project LOA Holder becomes aware of any issue or issues which may (to any reasonable subject-matter expert, including the persons performing the measurements and analysis) call into question the validity of any measured Level A harassment or Level B harassment isopleths to a significant degree, which were previously transmitted or communicated to NMFS Office of Protected Resources, LOA Holder must inform NMFS Office of Protected Resources within 1 business day of becoming aware of this issue or before the next pile is driven, whichever comes first;

(13) Full PAM detection data, metadata, and location of recorders (or GPS tracks, if applicable) must be submitted within 90 calendar days following completion of foundation installation pile driving each season and every 90 calendar days for transit lane PAM using the International Organization for Standardization (ISO) standard metadata forms and instructions available on the NMFS Passive Acoustic Reporting System website at: <https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates>. Concurrently, the full acoustic recordings from real-time systems must also be sent to the National Centers for Environmental Information (NCEI) at: <https://www.ncei.noaa.gov/products/passive-acoustic-data> for archiving;

(14) Inclusive of all instances wherein an exemption to a measure is taken (which must be reported to NMFS Office of Protected Resources within 24 hours), LOA Holder must submit

situational reports if the following circumstances occur, including but not limited to the following:

(i) If a North Atlantic right whale is sighted with no visible injuries or entanglement at any time by project PSOs or project personnel, the LOA Holder must, as soon as possible but within 24 hours, download and complete the *Real-Time North Atlantic Right Whale Reporting Template* spreadsheet found at: <https://www.fisheries.noaa.gov/resource/document/template-datasheet-real-time-north-atlantic-right-whale-acoustic-and-visual> and save the completed spreadsheet as a .csv file and email it to NMFS NEFSC-PSD (ne.rw.survey@noaa.gov), NMFS GARFO-PRD (nmfs.gar.incidental-take@noaa.gov), and NMFS OPR (pr.itp.monitoringreports@noaa.gov). If unable to report a sighting through the spreadsheet within 24 hours, call the relevant regional hotline (Greater Atlantic Region's (Maine to Virginia/North Carolina border) Hotline at 866-755-6622 or the Southeast Region's (North Carolina through the Gulf of Mexico) Hotline at 877-WHALE-HELP (877-942-5343)). Report the following information: the time (note time format), date (MM/DD/YYYY), location (latitude/longitude in decimal degrees; coordinate system used) of the observation, number of whales, animal description/certainty of observation (follow up with photos/video if taken), reporter's contact information, and Lease Areas number/project name, PSO/personnel name who made the observation, and PSO provider company (if applicable) (PAM detections are not reported to the Hotlines). If unable to report via the template or the regional hotline, enter the sighting via the WhaleAlert app (<http://www.whalealert.org/>). If this is not possible, report the sighting to the U.S. Coast Guard via channel 16. The report to the Coast Guard must include the same information as would be reported to the Hotline;

(ii) If a North Atlantic right whale is detected via real-time PAM, data must be submitted using the NMFS Passive Acoustic Reporting System Metadata and Detection data spreadsheets and instructions available at: <https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates>, as soon as feasible but no longer than 24 hours after the detection;

(iii) If a large whale other than a North Atlantic right whale is observed at any time by PSOs or Project personnel, LOA Holder must report the sighting to the

WhaleAlert app at: <http://www.whalealert.org/>;

(iv) In the event that personnel involved in the Project discover a stranded, entangled, injured, or dead marine mammal, the LOA Holder must immediately report the observation to NMFS. If in the Greater Atlantic Region (Maine through Virginia), call the NMFS Greater Atlantic Stranding Hotline (866-755-6622), and if in the Southeast Region (North Carolina through Florida), call the NMFS Southeast Stranding Hotline (877-WHALE-HELP (877-942-5343)). Separately, the LOA Holder must report, within 24 hours, the incident to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) and, if in the Greater Atlantic Region, to the NMFS Greater Atlantic Regional Fisheries Office (GARFO; nmfs.gar.incidental-take@noaa.gov) or, if in the Southeast Region, to the NMFS Southeast Regional Office (SERO; secmammalreports@noaa.gov). The report must include contact (*e.g.*, name, phone number, *etc.*), time, date, and location (*i.e.*, specify coordinate system) 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); photographs or video footage of the animal(s) (if available); and general circumstances under which the animal was discovered; and

(v) In the event of a suspected or confirmed vessel strike of a marine mammal by any vessel associated with the Project or other means by which Project activities caused a non-auditory injury or death of a marine mammal, the LOA Holder must immediately report the incident to NMFS. If in the Greater Atlantic Region (Maine through Virginia), call the NMFS Greater Atlantic Stranding Hotline (866-755-6622), and if in the Southeast Region (North Carolina through Florida) call the NMFS Southeast Stranding Hotline (877-WHALE-HELP (877-942-5343)). Separately, the LOA Holder must immediately report the incident to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) and, if in the Greater Atlantic Region, to the NMFS Greater Atlantic Regional Fisheries Office (GARFO; nmfs.gar.incidental-take@noaa.gov) or, if in the Southeast Region, to the NMFS Southeast Regional Office (SERO; secmammalreports@noaa.gov). The report must include time, date, and location (*i.e.*, specify coordinate system) of the incident; species identification (if

known) or description of the animal(s) involved (*i.e.*, identifiable features including animal color, presence of dorsal fin, body shape and size, *etc.*); vessel strike reported information (*e.g.*, name, affiliation, email for person completing the report); vessel strike witness (if different than the reporter) information (*e.g.*, name, affiliation, phone number, platform for person witnessing the event, *etc.*); vessel name and/or MMSI number; vessel size and motor configuration (inboard, outboard, jet propulsion); vessel's speed leading up to and during the incident; vessel's course/heading and what operations were being conducted (if applicable); part of vessel that struck marine mammal (if known); vessel damage notes; status of all sound sources in use at the time of the strike; if the marine mammal was seen before the strike event; description of behavior of the marine mammal before the strike event (if seen) and behavior immediately following the strike; description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike; environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, visibility, *etc.*) immediately preceding the strike; estimated (or actual, if known) size and length of marine mammal that was struck; if available, description of the presence and behavior of any other marine mammals immediately preceding the strike; other animal-specific details, if known (*e.g.*, length, sex, age class); behavior or estimated fate of the marine mammal post-strike (*e.g.*, dead, injured but alive, injured and moving, external visible wounds (linear wounds, propeller wounds, non-cutting blunt-force trauma wounds), blood or tissue observed in the water, status unknown, disappeared); to the extent practicable, any photographs or video footage of the marine mammal(s); and, any additional notes the witness may have from the interaction. For any numerical values provided (*i.e.*, location, animal length, vessel length, *etc.*), please provide if values are actual or estimated. The LOA Holder must immediately cease activities until the NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. The LOA Holder may not

resume their activities until notified by NMFS Office of Protected Resources.

(15) Any lost gear associated with the fishery surveys will be reported to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division (nmfs.gar.incidentaltake@noaa.gov) as soon as possible or but no later than 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear. All reasonable efforts, that do not compromise human safety, must be undertaken to recover gear.

§ 217.306 Letter of Authorization.

(a) To incidentally take marine mammals pursuant to this subpart, LOA Holder must apply for and obtain a LOA;

(b) LOA, unless suspended or revoked, may be effective for a period of time not to exceed December 31, 2029, the expiration date of this subpart;

(c) In the event of projected changes to the activity or to mitigation and monitoring measures required by the LOA, LOA Holder must apply for and obtain a modification of the LOA as described in § 217.307;

(d) The LOA must set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact (*i.e.*, mitigation) on the species, its habitat, and on the availability of the species for subsistence uses; and

(3) Requirements for monitoring and reporting.

(e) Issuance of the LOA must be based on a determination that the level of taking must be consistent with the findings made for the total taking allowable under the regulations of this subpart; and

(f) Notice of issuance or denial of the LOA must be published in the **Federal Register** within 30 calendar days of a determination.

§ 217.307 Modifications of Letter of Authorization.

(a) Any LOA issued under §§ 217.302 and 217.306 or this section for the activities identified in § 217.300(a) may be modified upon request by LOA Holder, provided that:

(1) The specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for this subpart (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section); and

(2) NMFS Office of Protected Resources determines that the

mitigation, monitoring, and reporting measures required by the previous LOA under this subpart were implemented.

(b) For any modification request to the LOA by the applicant that includes changes to the activities or the mitigation, monitoring, or reporting (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section), the LOA may be modified, provided that:

(1) NMFS Office of Protected Resources determines that the changes to the activity or the mitigation, monitoring, or reporting do not change the findings made for the regulations in this subpart and do not result in more than a minor change in the maximum annual or total estimated number of takes of any species or stock; and

(2) NMFS Office of Protected Resources may, if appropriate, publish a notice of proposed modified LOA in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the LOA.

(c) LOA issued under §§ 217.302 and 217.306 or this section for the activities identified in § 217.300(a) may be modified by NMFS under the following circumstances:

(1) Through adaptive management, NMFS Office of Protected Resources may modify (*e.g.*, delete, modify, or add to) the existing mitigation, monitoring, or reporting measures (after consulting with the LOA Holder regarding the practicability of the modifications), if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring;

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in the LOA include, but are not limited to:

(A) Results from LOA Holder's monitoring;

(B) Results from other marine mammals and/or sound research or studies; and

(C) Any information that reveals marine mammals may have been taken

in a manner, extent, or number not allowed by the regulations in this subpart or subsequent LOA.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS Office of Protected Resources shall publish a notice of proposed LOA in the **Federal Register** and solicit public comment.

(2) If NMFS Office of Protected Resources determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in the LOA issued pursuant to §§ 217.302 and 217.306 or this section, any LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within 30 calendar days of the issuance of a LOA under this subpart.

§§ 217.308–217.309 [Reserved]

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