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Connection Information

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Public Comment

Public comment letters will be accepted and should be submitted electronically to <https://meetings.npfmc.org/Meeting/Details/2939>.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: May 12, 2022.

Tracey L. Thompson,

Acting Deputy Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2022-10596 Filed 5-17-22; 8:45 am]

BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XC034]

North Pacific Fishery Management Council; Public Meeting

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

ACTION: Notice of hybrid meeting.

SUMMARY: The North Pacific Fishery Management Council (Council) Fishery Monitoring Advisory Committee (FMAC) will meet June 1, 2022.

DATES: The meeting will be held on Wednesday, June 1, 2022, from 8 a.m. to 4 p.m., Alaska Time.

ADDRESSES: The meeting will be a hybrid meeting. Attend in-person at the North Pacific Fisheries office, 1007 West Third Ave., Suite 400, Anchorage, AK 99501 or join online through the link at <https://meetings.npfmc.org/Meeting/Details/2936>.

Council address: North Pacific Fishery Management Council, 1007 W 3rd Ave., Anchorage, AK 99501-2252; telephone: (907) 271-2809. Instructions for attending the meeting are given under **SUPPLEMENTARY INFORMATION** below.

FOR FURTHER INFORMATION CONTACT: Sara Cleaver, Council staff; telephone: (907) 271-2809; email: sara.cleaver@noaa.gov. For technical support, please

contact Council administrative staff, email: npfmc.admin@noaa.gov.

SUPPLEMENTARY INFORMATION:

Agenda

Wednesday, June 1, 2022

The May 2021 FMAC agenda will include: (a) Updates since the last FMAC meeting; (b) an abbreviated 2021 Observer Annual report; (c) discussion on Trawl EM Initial Review analysis, and (d) other business.

The agenda is subject to change, and the latest version will be posted at <https://meetings.npfmc.org/Meeting/Details/2936> prior to the meeting, along with meeting materials.

Connection Information

You can attend the meeting online using a computer, tablet, or smartphone; or by phone only. Connection information will be posted online at: <https://meetings.npfmc.org/Meeting/Details/2936>. If you are attending the meeting in-person, please note that all attendees will be required to wear a mask.

Public Comment

Public comment letters will be accepted and should be submitted electronically to <https://meetings.npfmc.org/Meeting/Details/2936>.

Authority: 16 U.S.C. 1801 *et seq.*

Dated: May 12, 2022.

Tracey L. Thompson,

Acting Deputy Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2022-10595 Filed 5-17-22; 8:45 am]

BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XB975]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Site Characterization Surveys Off of Delaware

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

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to

Orsted Wind Power North America, LLC (Orsted), and its designees, Garden State Offshore Energy, LLC (Garden State) and Skipjack Offshore Energy, LLC (Skipjack), to incidentally harass marine mammals during marine site characterization surveys off the coast of Delaware and along potential export cable routes to landfall locations in Delaware and New Jersey.

DATES: This Authorization is effective from May 10, 2022 through May 9, 2023.

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

SUPPLEMENTARY INFORMATION:

Background

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

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

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

Summary of Request

On October 1, 2021, NMFS received a request from Orsted on behalf of Garden State and Skipjack, both subsidiaries of Orsted, for an IHA to take marine mammals incidental to marine site characterization surveys off the coast of Delaware. Following NMFS' review of the draft application, a revised version was submitted on November 24, 2021. The application was deemed adequate and complete on February 11, 2022. Orsted's request is for take of a small number of 16 species of marine mammals, by Level B harassment only. Neither Orsted nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued IHAs to Garden State (86 FR 33664; June 25, 2021) and Skipjack (86 FR 18943; April 12, 2021) for related work. Garden State's survey was effective until April 4, 2022 whereas work is still ongoing for Skipjack until their effectiveness end date of June 10, 2022. Orsted plans to survey the combined survey area of the aforementioned projects, including the same two Lease Areas currently being surveyed under those IHAs (see Figure 1).

Description of Activity

Overview

As part of their overall marine site characterization survey operations, Orsted plans to conduct high-resolution geophysical (HRG) and geotechnical surveys in Lease Areas OCS-A 0482 and 0519 (Lease Areas), and the associated export cable route (ECR) areas off the coast of Delaware (Figure 1).

The purpose of the marine site characterization surveys is to collect data concerning seabed (geophysical, geotechnical, and geohazard), ecological, and archeological conditions within the footprint of offshore wind facility development. Surveys are also conducted to support engineering design and to map Unexploded Ordnance (UXO). Underwater sound resulting from the site characterization survey activities, specifically HRG surveys, has the potential to result in incidental take of marine mammals in the form of Level B harassment. Table 1 identifies representative survey equipment with the expected potential to result in take of marine mammals.

Dates and Duration

The site characterization surveys are anticipated to occur between May 10, 2022 and May 9, 2023. The exact dates have not yet been established. The activity is expected to include up to 350

survey days over the course of a single year ("survey day" defined as a 24-hour (hr) activity period in which the assumed number of line kilometers (km) are surveyed). The number of anticipated survey days was calculated as the number of days needed to reach the overall level of effort required to meet survey objectives assuming any single vessel travels 4 knots (kn) (7.4 kilometers per hour (km/hr) and surveys cover, on average, 70 line km per 24-hr period. The applicant assumes the use of sparker systems, which produce the largest estimated harassment isopleths, on all survey days (see Table 1).

Specific Geographic Region

The activities will occur within the survey area which includes the Lease Areas and potential ECRs to landfall locations in Delaware, as shown in Figure 1. This survey area combines the survey areas associated with the previously issued Garden State (86 FR 33664; June 25, 2021) and Skipjack (86 FR 18943; April 12, 2021) IHAs. The combined Lease Areas (Garden State Lease Area OCS-A-0482 and Skipjack Lease Area OCS-A-0519) are comprised of approximately 568 square kilometers (km²) within the WEA of BOEM's Mid-Atlantic planning area (see Figure 1). Water depths in the Lease Area range from approximately 15 to 40 meters (m).

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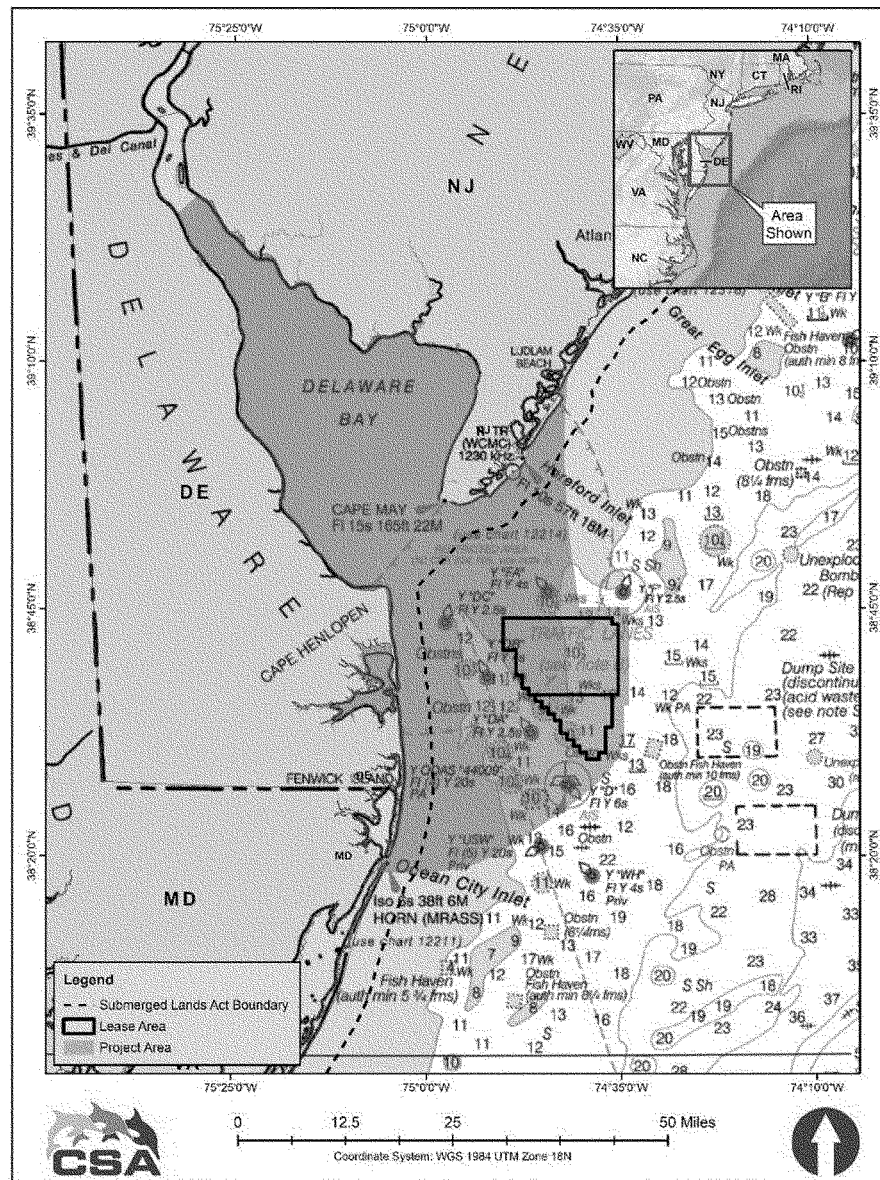


Figure 3. Project Area

Date: 9/3/2021
 Time: 2:20:34 PM
 User: dlan
 Name: 3673_T102_MarineSpecies_IHA_Fig03
 Path: V:\Jobs\3673_IHA_Summary\Task102_US_FL_IHA_Skipjack_Wind\3673_T102_MarineSpecies_IHA_Fig03.mxd
 Date Saved: 9/3/2021 11:53:56 AM
 Author:

Figure 1. Survey area for the site characterization surveys which include the Lease Areas and the potential export cable route area.

Detailed Description of Specific Activity

Orsted plans to conduct HRG survey operations, including multibeam depth sounding, seafloor imaging, and shallow and medium penetration sub-bottom profiling. The HRG surveys will include the use of seafloor mapping equipment with operating frequencies above 180 kilohertz (kHz) (e.g., side-scan sonar (SSS), multibeam echosounders (MBES)); magnetometers and gradiometers that have no acoustic

output; and shallow- to medium-penetration sub-bottom profiling (SBP) equipment (e.g., parametric sonars, compressed high-intensity radiated pulses (CHIRPs), boomers, sparkers) with operating frequencies below 180 kilohertz (kHz). No deep-penetration SBP surveys (e.g., airgun or bubble gun surveys) will be conducted. Survey equipment will be deployed from as many as three vessels during the site

characterization activities within the Lease area and ECR area.

Orsted assumes that vessels would generally conduct approximately 70 line km of survey effort per 24-hour operation period. On this basis a total of 350 vessel survey days are expected within Lease Areas OCS-A 0482, OCS-A 0519, and the associated ECR area. Water depths in the Lease Areas range from approximately 15 to 40 meters (m). Water depths within the ECR area

extend from the shoreline to approximately 40 m deep.

Acoustic sources planned for use during HRG survey activities by Orsted include the following. Survey equipment can either be towed, pole mounted, hull-mounted on the vessel (or on an ROV as noted above), or mounted on other survey equipment (*e.g.*, transponders): (Table 1):

- Shallow penetration, non-impulsive, intermittent, mobile, non-parametric SBPs (*i.e.*, CHIRP SBPs) are used to map the near-surface stratigraphy (top 0 to 10 m) of sediment below seabed. A CHIRP system emits sonar pulses that increase in frequency from approximately 2 to 20 kHz over time. The frequency range can be adjusted to meet project variables. These sources are typically mounted on a pole, either over the side of the vessel or through a moon pool in the bottom of the hull. The operational configuration

and relatively narrow beamwidth of these sources reduce the likelihood that an animal would be exposed to the signal.

- Medium penetration SBPs (boomers) are used to map deeper subsurface stratigraphy as needed. A boomer is a broad-band sound source operating in the 3.5 Hz to 10 kHz frequency range. This system is commonly mounted on a sled and towed behind the vessel. Boomers are impulsive and mobile sources. The sound levels produced by this equipment type have the potential to result in Level B harassment of marine mammals; and

- Medium penetration SBPs (sparkers) are used to map deeper subsurface stratigraphy as need. Sparkers create acoustic pulses from 50 Hz to 4 kHz omnidirectionally from the source, and are considered to be impulsive and mobile sources. Sparkers

are typically towed behind the vessel with adjacent hydrophone arrays to receive the return signals. The sound levels produced by this equipment type have the potential to result in Level B harassment of marine mammals.

Operation of other survey equipment types is not reasonably expected to result in take of marine mammals and will not be discussed further beyond the brief summaries provided in the notice of proposed IHA (87 FR 15922; March 21, 2022).

Table 1 identifies representative survey equipment with the expected potential to result in exposure of marine mammals and thus potentially result in take. The make and model of the listed geophysical equipment may vary depending on availability and the final equipment choices will vary depending upon the final survey design, vessel availability, and survey contractor selection.

Table 1. Summary of Representative HRG Survey Equipment

Equipment	Reference for SL	Operating Frequency (kHz)	SL (SPL dB re 1 μ Pa m)	SL (SEL dB re 1 μ Pa ² m ² s)	SL (PK dB re 1 μ Pa m)	Pulse Duration (width) (ms)	Repetition Rate (Hz)	Beamwidth (degrees)
ET 216 (2000DS or 3200 top unit)	MAN	2–16 2–8	195	178	-	20	6	24
ET 424 3200-XS	CF	4–24	176	152	-	3.4	2	71
ET 512i	CF	0.7–12	179	158	-	9	8	80
GeoPulse 5430A	MAN	2–17	196	183	-	50	10	55
Teledyne Benthos Chirp III - TTV 170	MAN	2–7	197	185	-	60	15	100
Pangeo SBI	MAN	4.5–12.5	188.2	165	-	4.5	45	120
AA, Dura-spark UHD Sparker (400 tips, 500 J) ¹	CF	0.3–1.2	203	174	211	1.1	4	Omni
AA, Dura-spark UHD Sparker Model 400 x 400 ⁴	CF	0.3–1.2	203	174	211	1.1	4	Omni
GeoMarine, Dual 400 Sparker, Model Geo-Source 800 ^{1,2}	CF	0.4–5	203	174	211	1.1	2	Omni
GeoMarine Sparker, Model Geo-Source 200-400 ^{1,2}	CF	0.3–1.2	203	174	211	1.1	4	Omni
GeoMarine Sparker, Model Geo-Source 200 Lightweight ^{1,2}	CF	0.3–1.2	203	174	211	1.1	4	Omni
AA, triple plate S-Boom(700–1,000 J) ³	CF	0.1–5	205	172	211	0.6	4	80

μ Pa = micropascal; AA = Applied Acoustics; CF = Crocker and Fratantonio (2016); CHIRP = compressed high-intensity radiated pulses; dB = decibel; EM = equipment mounted; ET = edgetech; J = joule; Omni = omnidirectional source; re = referenced to; PK = zero-to-peak sound pressure level; PM = pole mounted; SBI = sub-bottom imager; SEL = sound exposure level; SL = source level; SPL = root-mean-square sound pressure level; T = towed; TB = Teledyne benthos; UHD = ultra-high definition; WFA = weighting factor adjustment.

¹The Dura-spark measurements and specifications provided in Crocker and Fratantonio (2016) were used for all sparker systems for the survey. The data provided in Crocker and Fratantonio (2016) represent the most applicable data for similar sparker systems with comparable operating methods and settings when manufacturer or other reliable measurements are not available.

²The AA Dura-spark (500 J, 400tips) was used as a proxy source.

³Crocker and Fratantonio (2016) provide S-Boom measurements using two different power sources (CSP-D700 and CSP-N). The CSP-D700 power source was used in the 700 J measurements but not in the 1,000 J measurements. The CSP-N source was measured for both 700 J and 1,000 J operations but resulted in a lower SL; therefore, the single maximum SL value was used for both operational levels of the S-Boom.

Mitigation, monitoring, and reporting measures are described in detail later in this document (please see Mitigation and Monitoring and Reporting).

Comments and Responses

A notice of NMFS's proposal to issue an IHA to Orsted was published in the **Federal Register** on March 21, 2022 (87 FR 15922). That proposed notice described, in detail, Orsted's activities, the marine mammal species that may be affected by the activities, and the anticipated effects on marine mammals. In that notice, we requested public input on the request for authorization described therein, our analyses, the proposed authorization, and any other aspect of the notice of proposed IHA, and requested that interested persons submit relevant information, suggestions, and comments. This proposed notice was available for a 30-day public comment period.

During the 30-day public comment period, NMFS received comments from the Delaware Department of Resources and Environmental Control (DNREC), Oceana, and the Responsible Offshore Development Alliance (RODA). A few comments specifically addressed concerns regarding construction of a wind energy facility itself, which is outside the scope of NMFS' action considered herein. We do not specifically address those comments in further detail. All substantive comments, and NMFS' responses, are provided below, and the letters are available online at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-orsted-wind-power-north-america-llc-marine-site>. Please see the letters for full detail and rationale for the comments.

Comment 1: DNREC recommends harp seals (*Pagophilus groenlandicus*) and hooded seals (*Cystophora cristata*) also be included within the list of potentially impacted species. DNREC states that it would be beneficial to include all species occurring in the area, regardless of the infrequency of their occurrence.

Response: NMFS agrees with DNREC that the occurrence of all species occurring in the survey area should be evaluated in our analysis. NMFS has evaluated the occurrence of harp seals and has included additional information on their potential occurrence offshore of Delaware in the Description of Marine Mammals in the Area of Specified Activities section below. However, based on the best available information, including information on local sightings, and the temporal and spatial occurrence of the species, the likelihood of a harp seal being encountered in the

survey area is discountable, and NMFS is not authorizing the take of harp seals for Orsted's survey.

NMFS has further evaluated available information regarding the occurrence of hooded seals in the survey area. The limited data available support a conclusion that hooded seals occur rarely and irregularly in the survey area. DNREC did not provide any scientific data to support regular occurrence of hooded seals in the region and to quantify the potential for Level B harassment of hooded seals to occur and NMFS considers take of this species to be highly unlikely. Hooded seals are found at high latitudes in the North Atlantic and Arctic Oceans, breeding in ice packed areas. They spend a significant amount of time in deep waters, rarely hauling out along the coasts. Hooded seals are primarily found in Canada, although NMFS does acknowledge that a small number of individuals are increasingly being seen along the Atlantic coast. Due to their tendency to stay far offshore and as very few sightings have been documented along the Delaware coast, NMFS' evaluation has concluded that hooded seals are unlikely to be found within the survey area and are not discussed further in this document.

Comment 2: Oceana recommended that NMFS should require passive acoustic monitoring (PAM) at all times to maximize the probability of detection for North Atlantic right whales (NARWs), as well as other species and stocks. DNREC also expressed support for the use of PAM in combination with monitoring by protected species observers (PSOs), especially during nighttime operations.

Response: The commenters do not explain why they expect that PAM would be effective in detecting vocalizing mysticetes, nor does NMFS agree that this measure is warranted, as it is not expected to be effective for use in detecting the species of concern. It is generally accepted that, even in the absence of additional acoustic sources, using a towed passive acoustic sensor to detect baleen whales (including NARWs) is not typically effective because the noise from the vessel, the flow noise, and the cable noise are in the same frequency band and will mask the vast majority of baleen whale calls. Vessels produce low-frequency noise, primarily through propeller cavitation, with main energy in the 5–300 Hertz (Hz) frequency range. Source levels range from about 140 to 195 decibel (dB) re 1 μ Pa (micropascal) at 1 m (NRC, 2003; Hildebrand, 2009), depending on factors such as ship type, load, and speed, and ship hull and propeller

design. Studies of vessel noise show that it appears to increase background noise levels in the 71–224 Hz range by 10–13 dB (Hatch *et al.*, 2012; McKenna *et al.*, 2012; Rolland *et al.*, 2012). PAM systems employ hydrophones towed in streamer cables approximately 500 m behind a vessel. Noise from water flow around the cables and from strumming of the cables themselves is also low-frequency and typically masks signals in the same range. Experienced PAM operators participating in a recent workshop (Thode *et al.*, 2017) emphasized that a PAM operation could easily report no acoustic encounters, depending on species present, simply because background noise levels rendered any acoustic detection impossible. The same workshop report stated that a typical eight-element array towed 500 m behind a vessel could be expected to detect delphinids, sperm whales, and beaked whales at the required range, but not baleen whales, due to expected background noise levels (including seismic noise, vessel noise, and flow noise).

There are several additional reasons why we do not agree that use of PAM is warranted for 24-hour HRG surveys. While NMFS agrees that PAM can be an important tool for augmenting detection capabilities in certain circumstances, its utility in further reducing impact during HRG survey activities is limited. First, for this activity, the area expected to be ensonified above the Level B harassment threshold is relatively small (a maximum of 141 m); this reflects the fact that, to start with, the source level is comparatively low and the intensity of any resulting impacts would be lower level and, further, it means that inasmuch as PAM will only detect a portion of any animals exposed within a zone, the overall probability of PAM detecting an animal in the harassment zone is low. Together these factors support the limited value of PAM for use in reducing take with smaller zones. PAM is only capable of detecting animals that are actively vocalizing, while many marine mammal species vocalize infrequently or during certain activities, which means that only a subset of the animals within the range of the PAM would be detected (and potentially have reduced impacts). Additionally, localization and range detection can be challenging under certain scenarios. For example, odontocetes are fast moving and often travel in large or dispersed groups which makes localization difficult.

Given that the effects to marine mammals from the types of surveys authorized in this IHA are expected to be limited to low level behavioral

harassment even in the absence of mitigation, the limited additional benefit anticipated by adding this detection method (especially for NARWs and other low frequency cetaceans, species for which PAM has limited efficacy), and the cost and impracticability of implementing a full-time PAM program, we have determined the current requirements for visual monitoring are sufficient to ensure the least practicable adverse impact on the affected species or stocks and their habitat. NMFS has previously provided discussions on why PAM is not a required monitoring measure during HRG survey IHAs in past **Federal Register** notices (86 FR 21289, April 22, 2021 and 87 FR 13975, March 11, 2022 for examples).

Regarding monitoring for species that may be present yet go unobserved, NMFS recognizes that visual detection based mitigation approaches are not 100 percent effective. Animals are missed because they are underwater (availability bias) or because they are available to be seen, but are missed by observers (perception and detection biases) (e.g., Marsh and Sinclair, 1989). However, visual observation remains one of the best available methods for marine mammal detection. Although it is likely that some marine mammals may be present yet unobserved within the harassment zone, all expected take of marine mammals has been appropriately authorized. For mysticete species in general, it is unlikely that an individual would occur within the estimated 141 m harassment zone and remain undetected. For NARW in particular, the required Exclusion Zone is 500 m and, therefore, it is even less likely that an individual would approach the harassment zone undetected.

Comment 3: Oceana objects to NMFS' renewal process regarding the extension of any 1-year IHA with a truncated 15-day public comment period, and suggested an additional 30-day public comment period is necessary for any renewal request.

Response: NMFS' IHA renewal process meets all statutory requirements. In prior responses to comments about IHA renewals (e.g., 84 FR 52464; October 2, 2019 and 85 FR 53342, August 28, 2020), NMFS has explained how the renewal process, as implemented, is consistent with the statutory requirements contained in section 101(a)(5)(D) of the MMPA, and, further, promotes NMFS' goals of improving conservation of marine mammals and increasing efficiency in the MMPA compliance process.

Therefore, we intend to continue implementing the renewal process.

The notice of the proposed IHA published in the **Federal Register** on January 27, 2022 (87 FR 4200) made clear that the agency was seeking comment on the proposed IHA and the potential issuance of a renewal for this survey. Because any renewal is limited to another year of identical or nearly identical activities in the same location or the same activities that were not completed within the 1-year period of the initial IHA, reviewers have the information needed to effectively comment on both the immediate proposed IHA and a possible 1-year renewal, should the IHA holder choose to request one in the coming months.

While there would be additional documents submitted with a renewal request, for a qualifying renewal these would be limited to documentation that NMFS would make available and use to verify that the activities are identical to those in the initial IHA, are nearly identical such that the changes would have either no effect on impacts to marine mammals or decrease those impacts, or are a subset of activities already analyzed and authorized but not completed under the initial IHA. NMFS would also need to confirm, among other things, that the activities would occur in the same location; involve the same species and stocks; provide for continuation of the same mitigation, monitoring, and reporting requirements; and that no new information has been received that would alter the prior analysis. The renewal request would also contain a preliminary monitoring report, in order to verify that effects from the activities do not indicate impacts of a scale or nature not previously analyzed. The additional 15-day public comment period provides the public an opportunity to review these few documents, provide any additional pertinent information and comment on whether they think the criteria for a renewal have been met. Between the initial 30-day comment period on these same activities and the additional 15 days, the total comment period for a renewal is 45 days.

In addition to the IHA renewal process being consistent with all requirements under section 101(a)(5)(D), it is also consistent with Congress' intent for issuance of IHAs to the extent reflected in statements in the legislative history of the MMPA. Through the provision for renewals in the regulations, description of the process and express invitation to comment on specific potential renewals in the Request for Public Comments section of each proposed IHA, the description of

the process on NMFS' website, further elaboration on the process through responses to comments such as these, posting of substantive documents on the agency's website, and provision of 30 or 45 days for public review and comment on all proposed initial IHAs and Renewals respectively, NMFS has ensured that the public is "invited and encouraged to participate fully in the agency's decision-making process", as Congress intended.

Comment 4: Oceana remarked that NMFS must utilize the best available science, and further suggests that NMFS has not done so. Oceana specifically asserted that NMFS is not using the best available science with regards to the NARW population estimate and states that NMFS should be using the 336 estimate presented in the recent North Atlantic Right Whale Report Card (<https://www.narwc.org/report-cards.html>). Additionally, Oceana states that NMFS is not using the best available science with regard to NARW recent habitat usage patterns and should use up to date seasonality information that may differ from the March–April and November–December migration period cited in the notice, and that NMFS should fully consider the use of the area on the health and fitness of NARWs. Similarly, RODA urges NMFS to use the best available science including the most comprehensive models for estimating marine mammal take and developing robust mitigation measures.

Response: While NMFS agrees that the best available science should be used for assessing NARW abundance estimates, we disagree that the North Atlantic Right Whale Report Card (i.e., Pettis *et al.*, 2022) study represents the best available estimate for NARW abundance. Rather the revised abundance estimate (368; 95 percent with a confidence interval of 356–378) published by Pace (2021) (and subsequently included in the 2021 draft Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>)), which was used in the proposed IHA, provides the most recent and best available estimate, and introduced improvements to NMFS' right whale abundance model. Specifically, Pace (2021) looked at a different way of characterizing annual estimates of age-specific survival. NMFS considered all relevant information regarding NARW, including the information cited by commenters. However, NMFS relies on the SAR. Between the time of publication of the notice of proposed IHA and issuing this

IHA, NMFS updated its species web page to recognize the population estimate for NARWs as below 350 animals (<https://www.fisheries.noaa.gov/species/north-atlantic-right-whale>). We anticipate that this information will be presented in the draft 2022 SAR. We note that this change in abundance estimate would not change the estimated take of NARWs or authorized take numbers, nor affect our ability to make the required findings under the MMPA for Orsted's survey activities.

NMFS further notes that the commenters seem to be conflating the phrase "best available data" with "the most recent data". The MMPA specifies that the "best available data" must be used, which does not always mean the most recent. As is NMFS' prerogative, we referenced the best available NARW abundance estimate of 368 from the draft 2021 SARs as NMFS's determination of the best available data that we relied on in our analysis. The Pace (2021) results strengthened the case for a change in mean survival rates after 2010–2011, but did not significantly change other current estimates (population size, number of new animals, adult female survival) derived from the model. Furthermore, NMFS notes that the SARs are peer reviewed by other scientific review groups prior to being finalized and published and that the North Atlantic Right Whale Report Card (Pettis *et al.*, 2022) does not undertake this process.

The commenters also noted their concern regarding NARW habitat usage and seasonality, stating that NMFS was not appropriately considering relevant information on this topic. While Orsted's survey specifically intersects migratory habitat for NARWs, the year-round "core" NARW foraging habitat is located much further north in the southern area of Martha's Vineyard and Nantucket Islands where both visual and acoustic detections of NARWs indicate a nearly year-round presence (Oleson *et al.*, 2020). NMFS notes that prey for NARWs are mobile and broadly distributed throughout the survey area; therefore, NARW foraging efforts are not likely to be disturbed given the location of these planned activities in relation to the broader area that NARWs migrate through and northern areas where NARWs primarily forage. There is ample foraging habitat further north of this survey area that will not be ensonified by the acoustic sources used by Orsted, such as the Great South Channel and Georges Bank Shelf Break feeding biologically important area (BIA). Furthermore, and as discussed in the proposed notice, the spatial acoustic

footprint of the survey is very small relative to the spatial extent of the available foraging habitat.

Lastly, as we stated in the proposed notice, any impacts to marine mammals are expected to be temporary and minor, given the relative size of the survey area compared to the overall migratory route leading to foraging habitat (which is not affected by the specified activity). Comparatively, the Lease Area is approximately 568 km² and the NARW migratory BIA is 269,448 km². Because of this, and in context of the minor, low-level nature of the impacts expected to result from the planned survey, such impacts are not expected to result in disruption to biologically important behaviors.

Comment 5: Oceana noted that chronic stressors are an emerging concern for NARW conservation and recovery, and state that chronic stress may result in stunted growth and energetic effects for NARWs. Oceana suggested that NMFS has not fully considered both the use of the area and the effects of chronic stressors on the health and fitness of NARWs, as disturbance responses to NARWs could lead to chronic stress or habitat displacement, leading to an overall decline in their health and fitness.

Response: NMFS agrees with Oceana that chronic stressors are of concern for NARW conservation and recovery. We recognize that acute stress from acoustic exposure is one potential impact of these surveys, and that chronic stress can have fitness, reproductive, etc. impacts at the population-level scale. NMFS has carefully reviewed the best available scientific information in assessing impacts to marine mammals, and recognizes that the surveys have the potential to impact marine mammals through behavioral effects, stress response, and auditory masking. However, NMFS does not expect that the generally short-term, intermittent, and transitory marine site characterization survey activities planned by Orsted would create conditions of acute or chronic acoustic exposure leading to long-term physiological stress responses in marine mammals. NMFS has also prescribed a robust suite of mitigation measures, including extended distance shutdowns for NARW, that are expected to further reduce the duration and intensity of acoustic exposure, while limiting the potential severity of any possible behavioral disruption. The potential for chronic stress was evaluated in making the determination presented in NMFS's negligible impact analyses. Because NARW's generally use this location in a transitory manner, specifically for

migration, any potential impacts from these surveys are lessened for other behaviors due to the brief periods where exposure is possible. In context of these expected low-level impacts, which are not expected to meaningfully affect important behavior, we also refer again to the large size of the migratory corridor (BIA of 269,448 km²) compared with the survey area (568 km²). Thus, the transitory nature of NARWs at this location means it is unlikely for any exposure to cause chronic effects as Orsted's planned survey area and ensonified zones are much smaller than the overall migratory corridor. Because of this, NMFS does not expect acute or cumulative stress to be a detrimental factor to NARWs from Orsted's described survey activities.

Lastly, NMFS disagrees that the effects of Orsted's survey may contribute to stunted growth rates as suggested by Oceana's comments. The activities associated with Orsted's survey are outside the scope of activities described in the Steward *et al.* (2021) paper and NMFS does not expect impacts such as these to result from Orsted's described survey activities.

Comment 6: Oceana asserted that NMFS must fully consider the discrete effects of each activity and the cumulative effects of the suite of approved, proposed and potential activities on marine mammals and NARWs in particular and ensure that the cumulative effects are not excessive before issuing or renewing an IHA. RODA similarly expressed concern regarding analysis of cumulative impacts.

Response: Neither the MMPA nor NMFS' codified implementing regulations call for consideration of other unrelated activities and their impacts on populations. 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, and other relevant stressors. The 1989 final rule for the MMPA implementing regulations also addressed public comments regarding cumulative effects from future, unrelated activities. There NMFS stated that such effects are not considered in making findings under

section 101(a)(5) concerning negligible impact. In this case, this IHA, as well as other IHAs currently in effect or proposed within the specified geographic region, are appropriately considered an unrelated activity relative to the others. The IHAs are unrelated in the sense that they are discrete actions under section 101(a)(5)(D), issued to discrete applicants.

Section 101(a)(5)(D) 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. 50 CFR 216.104(a)(1). Thus, the “specified activity” for which incidental take coverage is being sought under section 101(a)(5)(D) is generally defined and described by the applicant. Here, Orsted was the applicant for the IHA, and we are responding to the specified activity as described in that application (and making the necessary findings on that basis).

Through the response to public comments in the 1989 implementing regulations, NMFS also indicated (1) that we would consider cumulative effects that are reasonably foreseeable when preparing a NEPA analysis, and (2) that reasonably foreseeable cumulative effects would also be considered under section 7 of the ESA for ESA-listed species, as appropriate. Accordingly, NMFS has written Environmental Assessments (EA) that addressed cumulative impacts related to substantially similar activities, in similar locations, e.g., the 2017 Ocean Wind, LLC EA for site characterization surveys off New Jersey; the 2018 Deepwater Wind EA for survey activities offshore Delaware, Massachusetts, and Rhode Island; the 2019 Avangrid EA for survey activities offshore North Carolina and Virginia; and the 2019 Orsted EA for survey activities offshore southern New England. Cumulative impacts regarding issuance of IHAs for site characterization survey activities such as those planned by Orsted have been adequately addressed under NEPA in prior environmental analyses that support NMFS’ determination that this action is appropriately categorically excluded from further NEPA analysis. NMFS independently evaluated the use of a categorical exclusion for issuance of Orsted’ IHA, which included consideration of extraordinary circumstances.

Separately, the cumulative effects of substantially similar activities in the same geographic region have been analyzed in the past under section 7 of the ESA when NMFS has engaged in formal intra-agency consultation, such as the 2013 programmatic Biological Opinion for BOEM Lease and Site Assessment Rhode Island, Massachusetts, New York, and New Jersey Wind Energy Areas (<https://repository.library.noaa.gov/view/noaa/29291>). Analyzed activities include those for which NMFS issued Garden State’s 2021 IHA and Skipjack’s 2021 IHA (86 FR 33664; June 25, 2021 and 86 FR 18943; April 12, 2021), which are substantially similar to those planned by Orsted, and its subsidiaries Skipjack and Garden State, under this current IHA request. This Biological Opinion determined that NMFS’ issuance of IHAs for site characterization survey activities associated with leasing, individually and cumulatively, are not likely to adversely affect listed marine mammals. NMFS notes, that while issuance of this IHA is covered under a different consultation, this BiOp remains valid and the portions of the surveys currently planned by Orsted from 2022 to 2023 that are within the geographic scope of the 2013 BiOp (i.e., portions in NJ) could have fallen under the scope of those analyzed previously.

Comment 7: RODA states that, to their knowledge, there are no resources easily accessible to the public to understand what authorizations are required for each of these activities (pre-construction surveys, construction, operations, monitoring surveys, etc.). RODA recommends that NMFS improve the transparency of this process and move away from what it refers to as a “segmented phase-by-phase and project-by-project approach to IHAs.”

Response: The MMPA, and its implementing regulations, allows, upon request, the incidental take of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographic region. NMFS responds to these requests by authorizing the incidental take of marine mammals if it is found that the taking would be of small numbers, have no more than a “negligible impact” on the marine mammal species or stock, and not have an “unmitigable adverse impact” on the availability of the species or stock for subsistence use. NMFS emphasizes that an IHA does not authorize the activity itself but authorizes the take of marine mammals incidental to the “specified activity” for which incidental take coverage is being sought. In this case, NMFS is

responding to the applicant, Orsted, and the specified activity described in their application and making necessary findings on the basis of what was provided in their application. The authorization of Orsted’s activity (note, not the authorization of takes incidental to that activity) is not within the jurisdiction of NMFS. NMFS refers RODA to the Permitting Dashboard for Federal Infrastructure Projects for further information on timelines and proposed authorizations planned for application for each of these activities: <https://www.permits.performance.gov/>.

NMFS is required to consider applications upon request. To date, NMFS has not received any joint applications. While an individual company owning multiple lease areas may apply for a single authorization to conduct site characterization surveys across a combination of those lease areas (see 85 FR 63508, October 8, 2020; 87 FR 13975, March 11, 2022), 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.

Comment 8: RODA expressed concern from fishermen regarding the process for the authorization of marine mammal harassment takes in OSW activities in contrast to regulations for marine mammal take applied to the fishing industry.

Response: As required under the Marine Mammal Protection Act for activities other than commercial fisheries and detailed elsewhere in this notice, NMFS assessed the impacts of site characterization survey activities on marine mammals and their habitat and made the necessary findings to issue this IHA to Orsted. NMFS notes that the impacts of commercial fisheries on marine mammals and incidental take for said fishing activities are managed pursuant to the requirements of a different section of the MMPA (section 118) and, therefore, that these concerns are outside the scope of NMFS’ action considered herein.

Comment 9: Oceana states that NMFS must make an assessment of which activities, technologies and strategies are truly necessary to provide information to inform development of Orsted’s offshore wind project and which are not critical, asserting that NMFS should prescribe the appropriate survey techniques. In general, Oceana stated that NMFS must require that all IHA applicants minimize the impacts of underwater noise to the fullest extent feasible, including through the use of best available technology and methods

to minimize sound levels from geophysical surveys.

Response: The MMPA requires that an IHA include measures that will effect the least practicable adverse impact on the affected species and stocks and, in practice, NMFS agrees that the IHA should include conditions for the survey activities that will first avoid adverse effects on NARWs in and around the survey site, where practicable, and then minimize the effects that cannot be avoided. NMFS has determined that the IHA meets this requirement to effect the least practicable adverse impact. Oceana does not make any specific recommendations of measures to add to the IHA. As part of the analysis for all marine site characterization survey IHAs, NMFS evaluated the effects expected as a result of the specified activity, made the necessary findings, and prescribed mitigation requirements sufficient to achieve the least practicable adverse impact on the affected species and stocks of marine mammals. It is not within NMFS' purview to make judgements regarding what may be appropriate techniques or technologies for an operator's survey objectives.

Comment 10: Oceana suggests that PSOs complement their survey efforts using additional technologies, such as infrared detection devices when in low-light conditions.

Response: NMFS agrees with Oceana regarding this suggestion and a requirement to utilize a thermal (infrared) device during low-light conditions was included in the proposed **Federal Register** notice and also as a requirement of the issued IHA.

Comment 11: Oceana recommended that NMFS restrict all vessels of all sizes associated with the proposed survey activities to speeds less than 10 kn (18.5 km/hr) at all times due to the risk of vessel strikes to NARWs and other large whales.

Response: While NMFS acknowledges that vessel strikes can result in injury or mortality, we have analyzed the potential for ship strike resulting from Orsted's activity and have determined that based on the nature of the activity and the required mitigation measures specific to vessel strike avoidance included in the IHA, potential for vessel strike is so low as to be discountable. These mitigation measures, most of which were included in the proposed IHA and all of which are required in the final IHA, include: A requirement that all vessel operators comply with 10 kn (18.5 km/hr) or less speed restrictions in any seasonal management areas (SMA), dynamic management areas (DMA) or Slow Zone while underway, and check

daily for information regarding the establishment of mandatory or voluntary vessel strike avoidance areas (SMAs, DMAs, Slow Zones) and information regarding NARW sighting locations; a requirement that all vessels greater than or equal to 19.8 m in overall length operating from November 1 through April 30 operate at speeds of 10 kn (18.5 km/hr) or less; a requirement that all vessel operators reduce vessel speed to 10 kn (18.5 km/hr) or less when any large whale, any mother/calf pairs, pods, or large assemblages of non-dolphinid cetaceans are observed near the vessel; a requirement that all survey vessels maintain a separation distance of 500 m or greater from any ESA-listed whales or other unidentified large marine mammals visible at the surface while underway; a requirement that, if underway, vessels must steer a course away from any sighted ESA-listed whale at 10 kn (18.5 km/hr) or less until 500 m minimum separation distance has been established; a requirement that, if an ESA-listed whale is sighted in a vessel's path, or within 500 m of an underway vessel, the underway vessel must reduce speed and shift the engine to neutral; a requirement that all vessels underway must maintain a minimum separation distance of 100 m from all non-ESA-listed baleen whales; and a requirement that all vessels underway must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an understanding that at times this may not be possible (e.g., for animals that approach the vessel). We have determined that the ship strike avoidance measures in the IHA are sufficient to ensure the least practicable adverse impact on species or stocks and their habitat. Furthermore, no documented vessel strikes have occurred for any marine site characterization surveys which were issued IHAs from NMFS during the survey activities themselves or while transiting to and from survey sites.

Comment 12: Oceana suggests that NMFS require vessels maintain a separation distance of at least 500 m from NARWs at all times.

Response: NMFS agrees with Oceana regarding this suggestion and a requirement to maintain a separation distance of at least 500 m from NARWs at all times was included in the proposed **Federal Register** notice and was included as a requirement in the issued IHA.

Comment 13: Oceana recommended that the IHA should require all vessels supporting site characterization to be equipped with and using Class A

Automatic Identification System (AIS) devices at all times while on the water. Oceana suggested this requirement should apply to all vessels, regardless of size, associated with the survey.

Response: NMFS is generally supportive of the idea that vessels involved with survey activities be equipped with and using Class A Automatic Identification System (devices) at all times while on the water. Indeed, there is a precedent for NMFS requiring such a stipulation for geophysical surveys in the Atlantic Ocean (38 FR 63268, December 7, 2018); however, these activities carried the potential for much more significant impacts than the marine site characterization surveys to be carried out by Orsted, with the potential for both Level A and Level B harassment take. Given the small isopleths and small numbers of take authorized by this IHA, NMFS does not agree that the benefits of requiring AIS on all vessels associated with the survey activities outweighs and warrants the cost and practicability issues associated with this requirement.

Comment 14: Oceana asserts that the IHA must include requirements to hold all vessels associated with site characterization surveys accountable to the IHA requirements, including vessels owned by the developer, contractors, employees, and others regardless of ownership, operator, and contract. They state that exceptions and exemptions will create enforcement uncertainty and incentives to evade regulations through reclassification and redesignation. They recommend that NMFS simplify this by requiring all vessels to abide by the same requirements, regardless of size, ownership, function, contract or other specifics.

Response: NMFS agrees with Oceana and required these measures in the proposed IHA and final IHA. The IHA requires that a copy of the IHA must be in the possession of Orsted, the vessel operators, the lead PSO, and any other relevant designees of Orsted operating under the authority of this IHA. The IHA also states that Orsted must ensure that the vessel operator and other relevant vessel personnel, including the PSO team, are briefed on all responsibilities, communication procedures, marine mammal monitoring protocols, operational procedures, and IHA requirements prior to the start of survey activity, and when relevant new personnel join the survey operations.

Comment 15: Oceana stated that the IHA must include a requirement for all phases of the Orsted site characterization to subscribe to the highest level of transparency, including

frequent reporting to federal agencies, requirements to report all visual and acoustic detections of NARWs and any dead, injured, or entangled marine mammals to NMFS or the Coast Guard as soon as possible and no later than the end of the PSO shift. Oceana states that to foster stakeholder relationships and allow public engagement and oversight of the permitting, the IHA should require all reports and data to be accessible on a publicly available website.

Response: NMFS agrees with the need for reporting and indeed, the MMPA calls for IHAs to incorporate reporting requirements. As included in the proposed IHA, the final IHA includes requirements for reporting that supports Oceana's recommendations. Orsted is required to submit a monitoring report to NMFS within 90 days after completion of survey activities that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, and describes, assesses and compares the effectiveness of monitoring and mitigation measures. PSO datasheets or raw sightings data must also be provided with the draft and final monitoring report. Further the draft IHA and final IHA stipulate that if a NARW is observed at any time by any survey vessels, during surveys or during vessel transit, Orsted must immediately report sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System and to the U.S. Coast Guard, and that any discoveries of injured or dead marine mammals be reported by Orsted to the Office of Protected Resources, NMFS, and to the New England/Mid-Atlantic Regional Stranding Coordinator as soon as feasible. All reports and associated data submitted to NMFS are included on the website for public inspection.

Comment 16: Oceana recommended increasing the Exclusion Zone to 1,000 m for NARWs.

Response: NMFS notes that the 500 m Exclusion Zone for NARWs required in the IHA already exceeds the modeled distance to the largest 160 dB Level B harassment isopleth distance (141 m during sparker use) by a substantial margin. Commenters do not provide a compelling rationale for why the Exclusion Zone should be even larger. Given that these surveys are relatively low impact and that, regardless, NMFS has prescribed a NARW Exclusion Zone that is significantly larger (500 m) than the conservatively estimated largest harassment zone (141 m), NMFS has determined that the Exclusion Zone is appropriate. Further, Level A harassment is not expected to result even in the absence of mitigation, given

the characteristics of the sources planned for use. As described in the Mitigation section, NMFS has determined that the prescribed mitigation requirements are sufficient to effect the least practicable adverse impact on all affected species or stocks.

Comment 17: Oceana recommends a shutdown requirement if a NARW or other ESA-listed species is detected in the clearance zone as well as a publically available explanation of any exemptions as to why the applicant would not be able to shut down in these situations.

Response: There are several shutdown requirements described in the **Federal Register** notice of the proposed IHA (87 FR 15922; March 21, 2022), and which are included in the final IHA, including the stipulation that geophysical survey equipment must be immediately shut down if any marine mammal is observed within or entering the relevant Exclusion Zone (EZ) while geophysical survey equipment is operational. There is no exemption for the shutdown requirement. In regards to reporting, Orsted must notify NMFS if a NARW is observed at any time by any survey vessels during surveys or during vessel transit. Additionally, Orsted is required to report the relevant survey activity information, such as such as the type of survey equipment in operation, acoustic source power output while in operation, and any other notes of significance (*i.e.*, pre-clearance survey, ramp-up, shutdown, end of operations, etc.) as well as the estimated distance to an animal and its heading relative to the survey vessel at the initial sighting and survey activity information. We note that if a right whale is detected within the Exclusion Zone before a shutdown is implemented, the right whale and its distance from the sound source, including if it is within the Level B harassment zone, would be reported in Orsted's final monitoring report and made publicly available on NMFS' website. Orsted is required to immediately notify NMFS of any sightings of NARWs and report upon survey activity information. NMFS believes that these requirements address the commenter's concerns.

Comment 18: Oceana recommended that when HRG surveys are allowed to resume after a shutdown event, the surveys should be required to use a ramp-up procedure to encourage any nearby marine life to leave the area.

Response: NMFS agrees with this recommendation and included in the **Federal Register** notice of the proposed IHA (87 FR 15922; March 21, 2022) and this final IHA a stipulation that when technically feasible, survey equipment

must be ramped up at the start or restart of survey activities. Ramp-up must begin with the power of the smallest acoustic equipment at its lowest practical power output appropriate for the survey. When technically feasible the power must then be gradually turned up and other acoustic sources added in a way such that the source level would increase gradually. NMFS notes that ramp-up would not be required for short periods where acoustic sources were shut down (*i.e.*, less than 30 minutes) if PSOs have maintained constant visual observation and no detections of marine mammals occurred within the applicable EZ.

Comment 19: RODA expressed concern regarding the potential for increased uncertainty in estimates of marine mammal abundance resulting from wind turbine presence during low aerial surveys and potential effects of NMFS' ability to continue using current low-flying survey methods to fulfill its mission of precisely and accurately assessing protected species.

Response: NMFS has determined that offshore wind development projects may impact several surveys carried out by its Northeast Fisheries Science Center (NEFSC), including aerial surveys for protected species. NEFSC has developed a federal survey mitigation program to mitigate the impacts to these surveys, and is in the early stages of implementing this program. However, this impact is outside the scope of analysis related to the authorization of take incidental to Orsted's specified activity under the MMPA.

Comment 20: RODA expressed concerns with the high amount of increased vessel traffic associated with the OSW projects throughout the region in areas transited or utilized by certain protected resources, as well as concern for vessel noise.

Response: Orsted did not request authorization for take incidental to vessel traffic during Orsted's marine site characterization survey. Nevertheless, NMFS analyzed the potential for vessel strikes to occur during the survey, and determined that the potential for vessel strike is so low as to be discountable. NMFS does not authorize any take of marine mammals incidental to vessel strike resulting from the survey. If Orsted were to strike a marine mammal with a vessel, this would be an unauthorized take and be in violation of the MMPA. This gives Orsted a strong incentive to operate its vessels with all due caution and to effectively implement the suite of vessel strike avoidance measures called for in the IHA. Orsted proposed a very

conservative suite of mitigation measures related to vessel strike avoidance, including measures specifically designed to avoid impacts to NARWs. Section 4(f) in the IHA contains a suite of non-discretionary requirements pertaining to ship strike avoidance, including vessel operation protocols and monitoring. To date, NMFS is not aware of site characterization vessel from surveys reporting a ship strike within the United States. When considered in the context of low overall probability of any vessel strike by Orsted vessels, given the limited additional survey-related vessel traffic relative to existing traffic in the survey area, the comprehensive visual monitoring, and other additional mitigation measures described herein, NMFS believes these measures are sufficiently protective to avoid ship strike. These measures are described fully in the Mitigation section below, and include, but are not limited to: Training for all vessel observers and captains, daily monitoring of NARW Sighting Advisory System, WhaleAlert app, and USCG Channel 16 for situational awareness regarding NARW presence in the survey area, communication protocols if whales are observed by any Orsted personnel, vessel operational protocol should any marine mammal be observed, and visual monitoring.

The potential for impacts related to an overall increase in the amount of vessel traffic due to OSW development is separate from the aforementioned analysis of potential for vessel strike during Orsted's specified survey activities. For more information, please see the response to comment 7 discussing cumulative impacts.

Comment 21: RODA defers to the Marine Mammal Commission's previous comments on this matter, expressing that "they are more knowledgeable on impacts of pile driving and acoustics to marine mammals".

Response: In response to RODA's deferral to the Marine Mammal Commission, the Commission, the agency charged with advising federal agencies on the impacts of human activity on marine mammals, has questioned in its previous public comment whether incidental take authorizations are even necessary for surveys utilizing HRG equipment (*i.e.*, take is unlikely to occur), and has subsequently informed NMFS that they would no longer be commenting on such actions, including Orsted's activity described herein. Additionally, comments related to pile driving and OSW construction are outside the scope

of this IHA and therefore are not discussed.

Comment 22: RODA defers to the September 9, 2020 letter submitted by seventeen Environmental NRGs and echoes their concerns.

Response: NMFS refers RODA to the **Federal Register** notice 85 FR 63508 (October 8, 2020) for previous responses to the Environmental NGOs' previous letter of which RODA references and defers expertise to.

Comment 22: RODA expressed concern that negative impacts to local fishermen and coastal communities as a result of a potentially adverse impact to marine mammals (*e.g.*, vessel strike resulting in death or severe injury) were not mentioned nor evaluated in "the LOA request for this project". (NMFS notes that its action here is a response to Orsted's request for an IHA, which is appropriate, rather than an LOA.) RODA also reiterated concern about the lack of adequate analysis of individual and cumulative impacts to marine mammals, noting existing fishery restrictions as a result of other NARW protections.

Response: Neither the MMPA nor our implementing regulations require NMFS to analyze impacts to other industries (*e.g.*, fisheries) or coastal communities from issuance of an ITA. Nevertheless, as detailed in the proposed IHA notice and in our responses to comments 11 and 20, NMFS has analyzed the potential for adverse impacts such as vessel strikes to marine mammals, including NARWs, as a result of Orsted's planned site characterization survey activities and determined that no serious injury or mortality is anticipated. In fact, as discussed in the Negligible Impact Analysis and Determination section, later in this document, no greater than low-level behavioral harassment is expected for any affected species. For NARW in particular it is considered unlikely, as a result of the required precautionary shutdown zone (*i.e.*, 500 m versus the estimated maximum Level B harassment zone of 141 m), that the authorized take would occur at all. Thus, NMFS would also not anticipate the impacts RODA raises as a result of issuing this IHA for site characterization survey activities to Orsted. In regards to cumulative impacts, we defer back to our response to comment 6.

Comment 23: RODA expressed interest in understanding the outcome if the number of actual takes exceed the number authorized during construction of an offshore wind project (*i.e.*, would the project be stopped mid-construction or operation), and how offshore wind developers will be held accountable for

impacts to protected species such that impacts are not inadvertently assigned to fishermen, should they occur. Lastly, RODA maintains that the OSW industry must be accountable for incidental takes from construction and operations separately from the take authorizations for managed commercial fish stocks.

Response: It is important to recognize that an IHA does not authorize the activity but authorizes take of marine mammals incidental to the activity. As described in condition 3(b) and (c) of the IHA, authorized take, by Level B harassment only, is limited to the species and numbers listed in Table 1 of the final IHA, and any taking exceeding the authorized amounts listed in Table 1 is prohibited and may result in the modification, suspension, or revocation of the IHA. As described in condition 4(e)(vii), shutdown of acoustic sources is required upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met, entering or within the Level B harassment zone as described in Table 2 of the IHA.

It is unclear why RODA would be concerned that the OSW developers are responsible for their own impacts and "the burdens of those are not also assigned to fishermen". Fishing impacts generally center on entanglement in fishing gear, which is a very acute, visible, and severe impact. In contrast, the pathway by which impacts occur incidental to construction or site characterization survey activities, such as those planned by Orsted here, is primarily acoustic in nature. Regardless, NMFS reiterates that this IHA does not authorize take incidental to construction activities, but site characterization survey activities, and any take beyond that authorized would be in violation of the MMPA. It is BOEM's responsibility as the permitting agency to make decisions regarding ceasing Orsted's overall offshore wind development activities, not NMFS. If the case suggested by RODA does occur, NMFS would work with BOEM and Orsted to determine the most appropriate means by which to ensure compliance with the MMPA. As noted previously in response to Comment 8, the impacts of commercial fisheries on marine mammals and incidental take for said fishing activities are indeed managed separately from those of non-commercial fishing activities such as offshore wind site characterization surveys (MMPA section 118).

Changes From the Proposed to the Final IHA

In response to DNREC's request to incorporate the occurrence of additional pinnipeds in our analysis, a description of harp seals has been added to the Description of Marine Mammals in the Area of Specified Activities section as well as details pertaining to their potential occurrence in Orsted's planned survey area used in our analysis. Elsewhere, no changes have occurred from the proposed to final IHA.

Since publication of the notice of proposed IHA, NMFS has acknowledged that the population estimate of NARWs is now under 350 animals (<https://www.fisheries.noaa.gov/species/north-atlantic-right-whale>). However, as discussed in our response to Comment #4 above, NMFS has determined that this change in abundance estimate would not change the estimated take of NARWs or authorized take numbers, nor affect our ability to make the required findings under the MMPA for Orsted's survey activities. The status and trends of the NARW population remain unchanged.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (e.g., physical and behavioral descriptions) may be found on NMFS's website (<https://www.fisheries.noaa.gov/find-species>).

Table 2 lists all species or stocks for which take is expected and is authorized for this action, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2021). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while

allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Atlantic and Gulf of Mexico SARs (e.g., Hayes *et al.*, 2021). All values presented in Table 2 are the most recent available at the time of publication and are available in the 2020 SARs (Hayes *et al.*, 2021) and the draft 2021 SARs (available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>).

TABLE 2—MARINE MAMMAL SPECIES LIKELY TO OCCUR NEAR THE SURVEY AREA THAT MAY BE AFFECTED BY ORSTED'S ACTIVITY

Common name	Scientific name	Stock	ESA/ MMPA status; strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Family Balaenidae: North Atlantic right whale ..	<i>Eubalaena glacialis</i>	Western Atlantic	E, D, Y	368 (0, 364, 2019) ⁵	0.7	7.7
Family Balaenopteridae (rorquals):						
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic	E, D, Y	6802 (0.24, 5573, 2016)	11	1.8
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia	E, D, Y	6292 (1.02, 3098, 2016)	6.2	0.8
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian Eastern Coastal	-, —, N	21,968 (0.31, 17002, 2016).	170	10.6
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine	-, —, Y	1396 (0, 1380, 2016)	22	12.15
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Physeteridae: Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic	E, D, Y	4349 (0.28, 3451, See SAR).	3.9	0
Family Delphinidae:						
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic	-, -, N	93,233 (0.71, 54443, See SAR).	544	27
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic	-, -, N	39,921 (0.27, 32032, See SAR).	320	0
Common bottlenose dolphin.	<i>Tursiops truncatus</i>	Western North Atlantic Off-shore.	-, -, N	62,851 (0.23, 51914, See SAR).	519	28
		Western North Atlantic North-eastern Migratory Coastal.	-, -, Y	6639 (0.41, 4759, 2016)	48	12.2–21.5
Long-finned pilot whale	<i>Globicephala melas</i>	Western North Atlantic	-, -, N	39,215 (0.3, 30627, See SAR).	306	29
Short-finned pilot whale	<i>Globicephala macrorhynchus</i> ..	Western North Atlantic	-, -, Y	28,924 (0.24, 23637, See SAR).	236	136
Risso's dolphin	<i>Grampus griseus</i>	Western North Atlantic	-, -, N	35,215 (0.19, 30051, 2016).	301	34

TABLE 2—MARINE MAMMAL SPECIES LIKELY TO OCCUR NEAR THE SURVEY AREA THAT MAY BE AFFECTED BY ORSTED'S ACTIVITY—Continued

Common name	Scientific name	Stock	ESA/ MMPA status; strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Common dolphin	<i>Delphinus delphis</i>	Western North Atlantic	-, -, N	172,974 (0.21, 145216, 2016).	1,452	390
Family Phocoenidae (por- poises).						
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy	-, -, N	95,543 (0.31, 74034, 2016).	851	164
Order Carnivora—Superfamily Pinnipedia						
Family Phocidae (earless seals).						
Gray seal ⁴	<i>Halichoerus grypus</i>	Western North Atlantic	-, -, N	27300 (0.22, 22785, 2016).	1,389	4453
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	-, -, N	61,336 (0.08, 57637, 2018).	1,729	339

¹ Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

² NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock>. CV is coefficient of variation; N_{min} is the minimum estimate of stock abundance.

³ These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

⁴ The NMFS stock abundance estimate (and associated PBR value) applies to the U.S. population only, however the actual stock abundance is approximately 451,431 (including animals in Canada). The annual mortality and serious injury (M/SI) value given is for the total stock.

⁵ The draft 2022 SARs have yet to be released; however, NMFS has updated its species webpage to recognize the population estimate for NARWs is now below 350 animals (<https://www.fisheries.noaa.gov/species/north-atlantic-right-whale>).

As indicated above, all 16 species (with 17 managed stocks) in Table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. While harp seals have been documented in the area, the spatial occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. In addition to what is included in Sections 3 and 4 of Orsted's application, the SARs, and NMFS' website, further detail informing the baseline for select species (e.g., information regarding current Unusual Mortality Events (UMEs)) was provided in the notice of proposed IHA (87 FR 15922; March 21, 2022), and is not repeated here. No new information is available to the species discussed in the notice of proposed since publication of that notice. Information regarding presence and habitat of harp seals is provided below.

Harp seals are highly migratory and occur throughout much of the North Atlantic and Arctic Oceans (Hayes *et al.*, 2021). Breeding occurs between late-February and April and adults then assemble on suitable pack ice to undergo the annual molt. The migration

then continues north to Arctic summer feeding groups. Harp seal occurrence in the survey area is considered rare. However, since the early 1990s, number of sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey (Katona *et al.*, 1993; Rubinstein 1994; Stevick and Fernald 1998; McAlpine 1999; Lacoste and Stenson 2000; Soulen *et al.*, 2013). Between 2015 and 2019, 5 harp seal strandings were documented in Delaware and 15 were documented in New Jersey (Hayes *et al.*, 2021). These extralimital appearances usually occur in January through May (Harris *et al.*, 2002), when the western North Atlantic stock is at its most southern point of migration. Harp seals are not expected to occur in the survey area, and NMFS has not authorized take of this species.

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; Wartzkow and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for Mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 3.

TABLE 3—MARINE MAMMAL HEARING GROUPS
[NMFS, 2018]

Hearing group	Generalized hearing range *
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz.
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
High-frequency (HF) cetaceans (true porpoises, <i>Kogia</i> , river dolphins, cephalorhynchid, <i>Lagenorhynchus cruciger</i> & <i>L. australis</i>)	275 Hz to 160 kHz.
Phocid pinnipeds (PW) (underwater (true seals)	50 Hz to 86 kHz.
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz.

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

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

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. 16 marine mammal species (14 cetacean and 2 pinniped (both phocid) species) have the reasonable potential to co-occur with the survey activities. Please refer to Table 2. Of the cetacean species that may be present, five are classified as low-frequency cetaceans (*i.e.*, all mysticete species), nine are classified as mid-frequency cetaceans (*i.e.*, all delphinid and ziphiid species and the sperm whale), and one is classified as high-frequency cetaceans (*i.e.*, harbor porpoise and *Kogia* spp.).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The notice of proposed IHA included a summary of the ways that Orsted's specified activity may impact marine mammals and their habitat (87 FR 15922; March 21, 2022). Detailed descriptions of the potential effects of similar specified activities have been provided in other recent **Federal Register** notices, including for survey activities using the same methodology, over a similar amount of time, and occurring in the Mid-Atlantic region, including Delaware waters (*e.g.*, 82 FR 20563, May 3, 2017; 85 FR 36537, June 17, 2020; 85 FR 37848, June 24, 2020; 85 FR 48179, August 10, 2020; 86 FR 11239, February 24, 2021, 86 FR 28061, May 25, 2021). No significant new information is available, and we refer the reader to these documents rather than repeating the details here. The Estimated Take section includes a quantitative analysis of the number of

individuals that are expected to be taken by Orsted's activity. The Negligible Impact Analysis and Determination section considers the potential effects of the specified activity, the Estimated Take section, and the Mitigation section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks. The notice of proposed IHA (87 FR 15922; March 21, 2022) also provided background information regarding active acoustic sound sources and acoustic terminology, which is not repeated here.

The potential effects of Orsted's specified survey activity are expected to be limited to Level B behavioral harassment. No permanent or temporary auditory effects, or significant impacts to marine mammal habitat, including prey, are expected.

Estimated Take

This section provides an estimate of the number of incidental takes authorized through the IHA, which informs both NMFS' consideration of "small numbers" and the negligible impact determination.

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

Authorized takes are by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to noise from certain

HRG acoustic sources. Based primarily on the characteristics of the signals by the acoustic sources planned for use, Level A harassment is neither anticipated (even absent mitigation), nor is authorized. Consideration of the anticipated effectiveness of the measures (*i.e.*, exclusion zones and shutdown measures), discussed in detail below in the Mitigation section, further strengthens the conclusion that Level A harassment is not a reasonably anticipated outcome of the survey activity. As described previously, no serious injury or mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) 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 take estimate.

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).

Level B Harassment for non-explosive sources—Though significantly driven by received level, the onset of behavioral

disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (e.g., frequency, predictability, duty cycle), the environment (e.g., bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 160 dB re 1 μ Pa (rms) for impulsive (e.g., sparkers and boomers) evaluated here for Orsted's activity.

Level A harassment for non-explosive sources—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). For more information, see NMFS 2018 Technical Guidance, which may be accessed at <https://www.fisheries.noaa.gov/national/>

marine-mammal-protection/marine-mammal-acoustic-technical-guidance.

Orsted's HRG survey includes the use of impulsive sources. However, as described above, NMFS has concluded that Level A harassment is not a reasonably likely outcome for marine mammals exposed to noise through use of the sources considered here, and the potential for Level A harassment is not evaluated further in this document. Please see Orsted's application for details of a quantitative exposure analysis exercise, *i.e.*, calculated Level A harassment isopleths and estimated Level A harassment exposures. Orsted did not request authorization of take by Level A harassment, and no take by Level A harassment is authorized by NMFS.

Ensonified Area

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

NMFS has developed a user-friendly methodology for determining the rms sound pressure level (SPL_{rms}) at the 160-dB isopleth for the purpose of estimating the extent of Level B harassment isopleths associated with HRG survey equipment (NMFS, 2020). This methodology incorporates frequency and some directionality to refine estimated ensonified zones. Orsted used NMFS's methodology, using the source level and operation mode of the equipment planned for used during the survey, to estimate the maximum ensonified area over a 24-hr period also referred to as the harassment

area (Table 1). Potential takes by Level B harassment are estimated within the ensonified area (*i.e.*, harassment area) as an SPL exceeding 160 dB re 1 μ Pa for impulsive sources (e.g., sparkers, boomers) within an average day of activity.

The harassment zone is a representation of the maximum extent of the ensonified area around a sound source over a 24-hr period. The harassment area was calculated per the following formula:

Stationary Source: Harassment zone = πr^2

Mobile Source: Harassment zone = (Distance/day 2r) + πr^2

Where r is the linear distance from the source to the isopleth for the Level B harassment threshold and day = 1 (*i.e.*, 24 hours).

The estimated potential daily active survey distance of 70 km was used as the estimated areal coverage over a 24-hr period. This distance accounts for the vessel traveling at roughly 4 kn (7.4 km/hr) and only for periods during which equipment <180 kHz is in operation. A vessel traveling 4 kn (7.4 km/hr) can cover approximately 110 km per day; however, based on data from 2017, 2018, and 2019 surveys, survey coverage over a 24-hour period is closer to 70 km per day as a result of delays due to, *e.g.*, weather, equipment malfunction. For daylight only vessels, the distance is reduced to 35 km per day; however, to maintain the potential for 24-hr surveys, the corresponding Level B harassment zones provide in Table 4 were calculated for each source based on the Level B threshold distances within a 24-hour (70 km) operational period.

TABLE 4—CALCULATED HARASSMENT ZONES ENCOMPASSING LEVEL B¹ THRESHOLDS FOR EACH SOUND SOURCE OR COMPARABLE SOUND SOURCE CATEGORY

Source	Level B harassment isopleths (m)	Level B harassment zone (km ²) ²
ET 216 CHIRP	9	1.3
ET 424 CHIRP	4	0.6
ET 512i CHIRP	6	0.8
GeoPulse 5430	21	2.9
TB CHIRP III	48	6.7
Pangeo SBI	22	3.1
AA Triple plate S-Boom (700–1,000 J)	34	4.8
AA, Dura-spark UHD Sparkers	141	³ 19.8
GeoMarine Sparkers	141	³ 19.8

AA = Applied Acoustics; CHIRP = compressed high-intensity radiated pulses; ET = edgetech; HF = high-frequency; J = joules; LF = low-frequency; MF = mid-frequency; PW = phocid pinnipeds in water; SBI = sub-bottom imager; SBP = sub-bottom profiler; TB = Teledyne benthos UHD = ultra-high definition.

¹ The applicant calculated both Level A and B isopleths to comprehensively assess the potential impacts of the predicted source operations as required for this Application. However, as described previously throughout this document, Level A takes are not expected and thus, are not authorized, therefore they are not discussed in this document. Please refer to Orsted's application for more information.

² Based on maximum threshold distances provided in Table 4 of Orsted's application and calculated for Level B root-mean-square sound pressure level thresholds.

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

Habitat based density models produced by the Duke University Marine Geospatial Ecology Laboratory (Roberts *et al.*, 2016, 2017, 2018, 2020) represent the best available information regarding marine mammal densities in the survey area. The density data presented by Roberts *et al.* (2016, 2017, 2018, 2020) incorporates aerial and shipboard line-transect data from NMFS and other organizations and incorporates data from 8 physiographic and 16 dynamic oceanographic and biological covariates, and controls for the influence of sea state, group size, availability bias, and perception bias on the probability of making a sighting. These density models were originally developed for all cetacean taxa in the U.S. Atlantic (Roberts *et al.*, 2016). In subsequent years, certain models have been updated based on additional data as well as certain methodological improvements. More information is available online at <https://seamap.env.duke.edu/models/Duke/EC/>. Marine mammal density estimates in the survey area (animals/km²) were obtained using the most recent model results for all taxa (Roberts *et al.*, 2016, 2017, 2018, 2020, 2021). The updated models incorporate sighting data, including sightings from NOAA's Atlantic Marine Assessment Program for Protected Species (AMAPPS) surveys.

For exposure analysis, density data from Roberts *et al.*, (2016, 2017, 2018, 2020, 2021) were mapped using a geographic information system (GIS). Density grid cells that included any portion of the survey Area were selected for all survey months (see Figure 3 of Orsted's application). For the survey area (*i.e.*, Lease Areas OCS-A-0482, 5219), the densities for each species as reported by Roberts *et al.*, 2016, 2017, 2018, 2020, 2021) were averaged by month; those values were then used to calculate the mean annual density for each species within the survey Area. Estimated mean monthly and annual densities (animals per km²) of all marine mammal species that may be taken by the survey are shown in Table 7 of Orsted's application. The mean annual density values used to estimate take numbers are shown in Table 5 below.

Due to limited data availability and difficulties identifying individuals to species level during visual surveys, individual densities are not able to be provided for all species and they are

instead grouped into "guilds" (Roberts *et al.*, 2021). These guilds include pilot whales, and seals. Long- and short-finned pilot whales are difficult to distinguish during shipboard surveys so individual habitat models were not able to be developed and thus, densities are assumed to apply to both species. Similarly, Roberts *et al.* (2018) produced density models for all seals but did not differentiate by seal species. Because the seasonality and habitat use by gray seals roughly overlaps with that of harbor seals in the survey areas, it was assumed that the mean annual density could refer to either of the represented species and was, therefore, divided equally between the two species.

For bottlenose dolphin densities, Roberts *et al.*, 2016, 2017, 2018, 2020, 2021 does not differentiate by stock. As previously discussed, both the northern migratory coastal stock and the Western North Atlantic offshore stock are expected to occur in the survey Area. To estimate densities for both stocks, the density blocks from within the survey Area were divided using the 20 m isobath (Hayes *et al.* 2021). Therefore, any density blocks located between the coastline and the 20 m isobath were attributed to the migratory coastal stock, and density blocks beyond this isobath were attributed to the offshore stock (see Table 5 for average annual densities calculated).

TABLE 5—ESTIMATED AVERAGE ANNUAL DENSITIES (ANIMALS PER km²) OF POTENTIALLY AFFECTED MARINE MAMMALS WITHIN THE SURVEY AREA BASED ON MONTHLY HABITAT DENSITY MODELS

[Roberts *et al.*, 2017, 2018, 2020, 2021]

Species	Average annual density (km ²)
Fin whale	0.001
Sei Whale	0
Minke Whale	0.0003
Humpback whale	0.0005
North Atlantic Right Whale	0.0017
Sperm Whale	0.0001
Atlantic White-Sided Dolphin	0.0015
Atlantic Spotted Dolphin	0.0007
Bottlenose Dolphin (Offshore) ¹ ..	0.0569
Bottlenose Dolphin (Migratory) ¹ ..	0.3972
Long-finned Pilot Whale ²	0.0004
Short-Finned Pilot Whale ²	0.0004
Risso's Dolphin	0
Common Dolphin	0.0101
Harbor Porpoise	0.0085
Gray Seal ^{3,4}	0.0007

TABLE 5—ESTIMATED AVERAGE ANNUAL DENSITIES (ANIMALS PER km²) OF POTENTIALLY AFFECTED MARINE MAMMALS WITHIN THE SURVEY AREA BASED ON MONTHLY HABITAT DENSITY MODELS—Continued

[Roberts *et al.*, 2017, 2018, 2020, 2021]

Species	Average annual density (km ²)
Harbor Seal ^{3,4}	0.0007

¹ Bottlenose dolphin stocks were delineated based on the 20-m isobath as identified in NMFS 2021 Stock Assessment Report; all density blocks falling inshore of the 20-m depth contour were assumed to belong to the migratory coastal stock, and those beyond this depth were assumed to belong to the offshore stock.

² Roberts (2021) only provides density estimates for "generic" pilot whales, so individual densities for each species are unavailable and densities were therefore assumed to apply to both species as both species have the same potential to occur in the survey area.

³ Seal densities are not given by individual months or species, instead, seasons are divided as summer (June, July, August) and Winter (September–May) and applied to "generic" seals; as a result, reported seasonal densities for spring and fall are the same and are not provided for each species (Roberts, 2021) (See Table 7 in Orsted's application).

⁴ Data used to establish the density estimates from Roberts (2021) are based on information for all seal species that may occur in the Western North Atlantic (*e.g.*, harbor, gray, hooded, harp). However, only the harbor seal and gray seal are reasonably expected to occur in the survey area, and the densities were split evenly between both species.

Take Calculation and Estimation

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

For most species, the potential Level B harassment exposures were estimated by multiplying the average annual density of each species (Table 5) within the Lease Area and ECR area by the largest daily harassment zone (19.8 km²) (Table 4). That product was then multiplied by the number of operating vessel days (350), and the product is rounded to the nearest whole number:

$$\text{Estimated take} = \text{species density} \times \text{harassment zone} \times \# \text{ of Survey Days}$$

For bottlenose dolphin densities, Roberts *et al.*, (2016a, 2016b, 2017, 2018, 2020) does not differentiate by individual stock. The WNA offshore stock is assumed to be located in depths exceeding the 20 m isobath, while the WNA Northern migratory coastal stock is assumed to be found in shallower depths than the 20 m isobath north of Cape Hatteras (Reeves *et al.*, 2002; Waring *et al.*, 2016). The maximum potential Level B harassment takes calculated for each stock of bottlenose

dolphins are based on the full survey duration occurring inside or outside the 20 m isobath; however only a portion of the survey will occur in each area. At this time, Orsted does not know the exact number of survey days that may occur within each area, and could not differentiate the maximum number of calculated instances of take (2,752, calculated for the migratory stock) between the two stocks of bottlenose dolphins potentially present during the survey activities. Orsted therefore

requested, and NMFS authorizes, 2,752 instances of take of bottlenose dolphins, regardless of stock.

No takes were calculated for sei whale, sperm whale, or Risso's dolphin; however, based on anticipated species distributions and data from previous surveys in the same general area it is possible that these species could be encountered. Therefore, Orsted requested, and NMFS authorizes, takes of these species based on estimated group sizes (Kenney and Vigness-Raposa, 2010; Barkaszi and Kelly, 2019).

For common dolphins, only 70 takes were calculated. However, draft Protected Species Observer (PSO) reports from the ongoing Garden State and Skipjack surveys near the action area and completed surveys from 2018 through 2020 indicate the potential for more common dolphins to be encountered in the area. Therefore, Orsted requested, and NMFS authorizes, take of 400 common dolphins. Calculated exposure estimates and take authorizations are shown in Table 6.

TABLE 6—AUTHORIZED AMOUNT OF TAKING, BY LEVEL B HARASSMENT ONLY, BY SPECIES AND STOCK AND PERCENT OF TAKE BY STOCK

Species	Stock	Abundance	Level B takes ^a	Max percent of population
Low-frequency cetaceans:				
Fin whales	Western North Atlantic	6,802	7	0.10
Sei whales	Nova Scotia	6,292	0 (1)	0.02
Minke whales	Canadian Eastern Coastal	21,968	2	0.01
Humpback whales	Gulf of Maine	1,396	4	0.29
North Atlantic right whale	Western Atlantic	368	11	2.99
Mid-frequency cetaceans:				
Sperm whale	North Atlantic	4,349	0 (3)	0.07
Atlantic white-sided dolphin	Western North Atlantic	93,233	10 (50)	0.05
Atlantic spotted dolphin	Western North Atlantic	39,921	5 (15)	0.04
Common bottlenose dolphin ^b	WNA Offshore	62,851	^c 2,752	4.38
	WNA Northern Migratory Coastal	6,639		41.45
Pilot whales	Short-finned	28,924	3 (20)	0.07
	Long-finned	39,215	3 (20)	0.05
Risso's dolphin	Western North Atlantic	35,215	0 (30)	0.09
Common dolphin	Western North Atlantic	172,974	70 (400)	0.23
High-frequency cetaceans:				
Harbor porpoise	Gulf of Maine/Bay of Fundy	95,543	82	0.09
Pinnipeds:				
Gray seal	Western North Atlantic	27,300	4	0.01
Harbor seal	Western North Atlantic	61,336	4	0.01

a. Parentheses denote take authorization where different from Orsted's calculated take estimates. Calculated takes were adjusted for the take authorization in one of two ways: (1) For species for which calculated take was significantly less than the number of individuals reported in the available monitoring reports and any available draft data (e.g., ongoing surveys) in the area, the total number of individuals reported were used for take requests; (2) For species with no calculated takes, or takes were less than mean group size, requested takes were based the mean group sizes derived from the following references:

- Sei whale: Kenney and Vigness-Raposa, 2010
- Sperm whale: Barkaszi and Kelly, 2018
- Atlantic white-sided dolphin: NMFS, 2021
- Atlantic spotted dolphin: NMFS, 2021
- Pilot whales: Kenney and Vigness-Raposa, 2010
- Risso's dolphin: Barkaszi and Kelly, 2018

b. Take estimate is based on the maximum number of calculated instances of take for either stock and is assumed to apply to all bottlenose dolphins potentially present in the survey area. Therefore takes could consist of individuals from either the Offshore or the Northern Migratory Coastal stock. Although unlikely, for purposes of calculating max percentage of population, we assume all takes could be allocated to either stock.

c. Assumes multiple repeated takes of same individuals from each stock. Please see the Small Numbers section for additional information.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action).

NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting 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 (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of

accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations.

Mitigation for Marine Mammals and Their Habitat

The following mitigation measures will be implemented during Orsted's marine site characterization surveys. Pursuant to section 7 of the ESA, Orsted will also be required to adhere to relevant Project Design Criteria (PDC) of the NMFS Greater Atlantic Regional Office (GARFO) programmatic consultation (specifically PDCs 4, 5, and 7) regarding geophysical surveys along the U.S. Atlantic coast (see NOAA GARFO, 2021; <https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic#offshore-wind-site-assessment-and-site-characterization-activities-programmatic-consultation>).

Marine Mammal Exclusion Zones and Harassment Zones

Marine mammal EZ will be established around the HRG survey equipment and monitored by NMFS-approved PSOs:

- 500 m EZ for NARWs during use of acoustic sources <180 kHz (e.g., Sparkers, Non-parametric sub-bottom profilers); and
- 100 m EZ for all other marine mammals, with certain exceptions specified below, during operation of impulsive acoustic sources (boomer and/or sparker).

If a marine mammal is detected approaching or entering the EZs during the HRG survey, the vessel operator will adhere to the shutdown procedures described below to minimize noise impacts on the animals. These stated requirements will be included in the site-specific training to be provided to the survey team.

Pre-Start Clearance

Marine mammal clearance zones will be established around the HRG survey equipment and monitored by PSOs:

- 500 m for all ESA-listed marine mammals; and
- 100 m for all other marine mammals.

Orsted will implement a 30-minute pre-start clearance period prior to the initiation of ramp-up of specified HRG equipment. During this period, clearance zones will be monitored by

PSOs, using the appropriate visual technology. Ramp-up may not be initiated if any marine mammal(s) is within its respective clearance zone. If a marine mammal is observed within a clearance zone during the pre-start clearance period, ramp-up may not begin until the animal(s) has been observed exiting its respective exclusion zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes and seals, and 30 minutes for all other species).

Ramp-Up of Survey Equipment

A ramp-up procedure, involving a gradual increase in source level output, is required at all times as part of the activation of the acoustic source when technically feasible. The ramp-up procedure will be used at the beginning of HRG survey activities in order to provide additional protection to marine mammals near the survey area by allowing them to vacate the area prior to the commencement of survey equipment operation at full power. Operators should ramp-up sources to half power for 5 minutes and then proceed to full power.

Ramp-up activities will be delayed if a marine mammal(s) enters its respective exclusion zone. Ramp-up will continue if the animal has been observed exiting its respective exclusion zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes and 30 minutes for all other species).

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. Acoustic source activation may only occur at night where operational planning cannot reasonably avoid such circumstances.

Shutdown Procedures

An immediate shutdown of the impulsive HRG survey equipment will be required if a marine mammal is sighted entering or is within its respective exclusion zone. The vessel operator must comply immediately with any call for shutdown by the Lead PSO. Any disagreement between the Lead PSO and vessel operator should be discussed only after shutdown has occurred. Subsequent restart of the survey equipment can be initiated if the animal has been observed exiting its respective exclusion zone or until an additional time period has elapsed (i.e., 15 minutes for small odontocetes and 30 minutes for all other species).

If species for which authorization has not been granted, or, a species for which authorization has been granted but the authorization number of takes have been met, approaches or is observed within the Level B harassment zone (Table 4), shutdown will occur.

If the acoustic source is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, it may be activated again without ramp-up if SOs have maintained constant observation and no detections of any marine mammal have occurred within the respective exclusion zones. If the acoustic source is shut down for a period longer than 30 minutes, then pre-clearance and ramp-up procedures will be initiated as described in the previous section.

The shutdown requirement will be waived for pinnipeds and for small delphinids of the following genera: *Delphinus*, *Lagenorhynchus*, *Stenella*, and *Tursiops*. Specifically, if a delphinid from the specified genera or a pinniped is visually detected approaching the vessel (i.e., to bow ride) or towed equipment, shutdown is not required. Furthermore, if there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived), PSOs must use best professional judgement in making the decision to call for a shutdown. Additionally, shutdown is required if a delphinid or pinniped is detected in the exclusion zone and belongs to a genus other than those specified.

Shutdown, pre-start clearance, and ramp-up procedures are not required during HRG survey operations using only non-impulsive sources (e.g., echosounders) other than non-parametric sub-bottom profilers (e.g., CHIRPs).

Vessel Strike Avoidance

Orsted must adhere to the following measures except in the case where compliance will create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply:

- Vessel operators and crews must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A visual observer aboard the vessel must monitor a vessel strike avoidance zone based on the appropriate separation distance around the vessel (distances stated below). Visual observers monitoring the vessel

strike avoidance zone may be third-party observers (*i.e.*, PSOs) or crew members, but crew members responsible for these duties must be provided sufficient training to (1) distinguish protected species from other phenomena, and (2) broadly identify a marine mammal as a right whale, other whale (defined in this context as sperm whales or baleen whales other than right whales), or other marine mammal;

- All survey vessels, regardless of size, must observe a 10 kn (18.5 km/hr) speed restriction in specified areas designated by NMFS for the protection of NARWs from vessel strikes including SMAs and DMAs when in effect;

- Members of the monitoring team will consult NMFS NARW reporting system and Whale Alert, as able, for the presence of NARWs throughout survey operations, and for the establishment of a DMA. If NMFS should establish a DMA in the survey area during the survey, the vessels will abide by speed restrictions in the DMA;

- All vessels greater than or equal to 19.8 m in overall length operating from November 1 through April 30 will operate at speeds of 10 kn (18.5 km/hr) or less at all times;

- All vessels must reduce their speed to 10 kn (18.5 km/hr) or less when mother/calf pairs, pods, or large assemblages of any species of cetaceans is observed near a vessel;

- All vessels must maintain a minimum separation distance of 500 m from right whales and other ESA-listed large whales;

- If a whale is observed but cannot be confirmed as a species other than a right whale or other ESA-listed large whale, the vessel operator must assume that it is a right whale and take appropriate action;

- All vessels must maintain a minimum separation distance of 100 m from non-ESA listed whales;

- All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an understanding that at times this may not be possible (*e.g.*, for animals that approach the vessel);

- When marine mammals are sighted while a vessel is underway, the vessel shall take action as necessary to avoid violating the relevant separation distance (*e.g.*, attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If marine mammals are sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This

does not apply to any vessel towing gear or any vessel that is navigationally constrained.

Project-specific training will be conducted for all vessel crew prior to the start of a survey and during any changes in crew such that all survey personnel are fully aware and understand the mitigation, monitoring, and reporting requirements. Prior to implementation with vessel crews, the training program will be provided to NMFS for review and approval. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew member understands and will comply with the necessary requirements throughout the survey activities.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered to by NMFS, NMFS has determined that the mitigation measures provide the means of effective the least practicable impact on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

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

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

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) Action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life

history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;

- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;

- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and

- Mitigation and monitoring effectiveness.

Monitoring Measures

Visual monitoring will be performed by qualified, NMFS-approved PSOs, the resumes of whom will be provided to NMFS for review and approval prior to the start of survey activities. Orsted will employ independent, dedicated, trained PSOs, meaning that the PSOs must (1) be employed by a third-party observer provider, (2) have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards), and (3) have successfully completed an approved PSO training course appropriate for their designated task. On a case-by-case basis, non-independent observers may be approved by NMFS for limited, specified duties in support of approved, independent PSOs on smaller vessels with limited crew operating in nearshore waters.

The PSOs will be responsible for monitoring the waters surrounding each survey vessel to the farthest extent permitted by sighting conditions, including exclusion zones, during all HRG survey operations. PSOs will visually monitor and identify marine mammals, including those approaching or entering the established exclusion zones during survey activities. It will be the responsibility of the Lead PSO on duty to communicate the presence of marine mammals as well as to communicate the action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate.

During all HRG survey operations (*e.g.*, any day on which use of an HRG source is planned to occur), a minimum

of one PSO must be on duty during daylight operations on each survey vessel, conducting visual observations at all times on all active survey vessels during daylight hours (*i.e.*, from 30 minutes prior to sunrise through 30 minutes following sunset). Two PSOs will be on watch during nighttime operations. The PSO(s) will ensure 360 degree visual coverage around the vessel from the most appropriate observation posts and will conduct visual observations using binoculars and/or night vision goggles and the naked eye while free from distractions and in a consistent, systematic, and diligent manner. PSOs may be on watch for a maximum of 4 consecutive hours followed by a break of at least 2 hours between watches and may conduct a maximum of 12 hours of observations per 24-hr period. In cases where multiple vessels are surveying concurrently, any observations of marine mammals will be communicated to PSOs on all nearby survey vessels.

PSOs must be equipped with binoculars and have the ability to estimate distance and bearing to detect marine mammals, particularly in proximity to exclusion zones. Reticulated binoculars must also be available to PSOs for use as appropriate based on conditions and visibility to support the sighting and monitoring of marine mammals. During nighttime operations, night-vision goggles with thermal clip-ons and infrared technology will be used. Position data will be recorded using hand-held or vessel GPS units for each sighting.

During good conditions (*e.g.*, daylight hours; Beaufort sea state BSS 3 or less), to the maximum extent practicable, PSOs will also conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the active acoustic sources. Any observations of marine mammals by crew members aboard any vessel associated with the survey will be relayed to the PSO team. Data on all PSO observations will be recorded based on standard PSO collection requirements. This will include dates, times, and locations of survey operations; dates and times of observations, location and weather, details of marine mammal sightings (*e.g.*, species, numbers, behaviors); and details of any observed marine mammal behavior that occurs (*e.g.*, notes behavioral disturbances). For more detail on the monitoring requirements, see Condition 5 of the issued IHA.

Reporting Measures

Within 90 days after completion of survey activities or expiration of this IHA, whichever comes sooner, a draft comprehensive report will be provided to NMFS that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, summarizes the number of marine mammals observed during survey activities (by species, when known), summarizes the mitigation actions taken during surveys including what type of mitigation and the species and number of animals that prompted the mitigation action, when known), and provides an interpretation of the results and effectiveness of all mitigation and monitoring. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS. A final report must be submitted within 30 days following any comments on the draft report. All draft and final marine mammal and acoustic monitoring reports must be submitted to PR.ITP.MonitoringReports@noaa.gov and ITP.Corcoran@noaa.gov. The report must contain at minimum, the following:

- PSO names and affiliations;
- Dates of departures and returns to port with port names;
- Dates and times (Greenwich Mean Time) of survey effort and times corresponding with PSO effort;
- Vessel location (latitude/longitude) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts;
- Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any line change;
- Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including wind speed and direction, Beaufort sea state, Beaufort wind force, swell height, weather conditions, cloud cover, sun glare, and overall visibility to the horizon;
- Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (*e.g.*, vessel traffic, equipment malfunctions); and
- Survey activity information, such as type of survey equipment in operation, acoustic source power output while in operation, and any other notes of significance (*i.e.*, pre-clearance survey, ramp-up, shutdown, end of operations, etc.).

If a marine mammal is sighted, the following information should be recorded:

- Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
 - PSO who sighted the animal;
 - Time of sighting;
 - Vessel location at time of sighting;
 - Water depth;
 - Direction of vessel's travel (compass direction);
 - Direction of animal's travel relative to the vessel;
 - Pace of the animal;
 - Estimated distance to the animal and its heading relative to vessel at initial sighting;
 - Identification of the animal (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix of species;
 - Estimated number of animals (high/low/best);
 - Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.);
 - Description (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);
 - Detailed behavior observations (*e.g.*, number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior);
 - Animal's closest point of approach and/or closest distance from the center point of the acoustic source;
 - Platform activity at time of sighting (*e.g.*, deploying, recovering, testing, data acquisition, other); and
 - Description of any actions implemented in response to the sighting (*e.g.*, delays, shutdown, ramp-up, speed or course alteration, etc.) and time and location of the action.
- If a NARW is observed at any time by PSOs or personnel on any project vessels, during surveys or during vessel transit, Orsted must immediately report sighting information to the NMFS NARW Sighting Advisory System: (866) 755-6622. NARW sightings in any location may also be reported to the U.S. Coast Guard via channel 16.
- In the event that Orsted personnel discover an injured or dead marine mammal, Orsted will report the incident to the NMFS Office of Protected Resources (OPR) and the NMFS New England/Mid-Atlantic Stranding Coordinator as soon as feasible. The report will include the following information:
- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);

- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

In the unanticipated event of a ship strike of a marine mammal by any vessel involved in this activities covered by the IHA, Orsted will report the incident to NMFS OPR and the NMFS New/England/Mid-Atlantic Stranding Coordinator as soon as feasible. The report will include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Species identification (if known) or description of the animal(s) involved;
- Vessel's speed during and leading up to the incident;
- Vessel's course/heading and what operations were being conducted (if applicable);
- Status of all sound sources in use;
- 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) immediately preceding the strike;
- Estimated size and length of animal that was struck;
- Description of the behavior of the marine mammal immediately preceding and following the strike;
- If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
- Estimated fate of the animal (*e.g.*, dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
- To the extent practicable, photographs or video footage of the animal(s).

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of

recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels). To avoid repetition, our analysis applies to all species listed in Table 6, given that NMFS expects the anticipated effects of the survey to be similar in nature. Where there are meaningful differences between species or stocks—as is the case of the NARW—they are included as separate subsections below. NMFS does not anticipate that serious injury or mortality will occur as a result from HRG surveys, even in the absence of mitigation, and no serious injury or mortality is authorized. As discussed in the Potential Effects of Specified Activities on Marine Mammals and their Habitat section, non-auditory physical effects and vessel strike are not expected to occur. NMFS expects that all potential takes will be in the form of Level B behavioral harassment in the form of temporary avoidance of the area or decreased foraging (if such activity was occurring), reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Southall *et al.*, 2007, 2021). Even repeated Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus will not result in any adverse impact to the stock as a whole. As described above, Level A harassment is not expected to occur given the nature of the operations and the estimated small size of the Level A harassment zones.

In addition to being temporary, the maximum expected harassment zone around the survey vessel is 141 m. Therefore, the ensonified area surrounding each vessel is relatively small compared to the overall distribution of the animals in the area and their use of the habitat. Feeding behavior is not likely to be significantly impacted as prey species are mobile and are broadly distributed throughout the survey area; therefore, marine mammals that may be temporarily displaced during survey activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Because of the temporary nature of the disturbance and the availability of similar habitat and resources in the surrounding area, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

There are no rookeries, mating or calving grounds known to be biologically important to marine mammals within the survey area and there are no feeding areas known to be biologically important to marine mammals within the survey area. The survey area lies significantly south (over 250 miles (402 km)) of where Biologically Important Areas are defined for fin and humpback whales. Therefore, they are not considered to be "nearby" the survey area and are not discussed further. There is no designated critical habitat for any ESA-listed marine mammals in the survey area.

North Atlantic Right Whales

The status of the NARW population is of heightened concern and therefore, merits additional analysis. As noted previously, elevated NARW mortalities began in June 2017 and there is an active UME. Overall, preliminary findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of right whales. The survey area overlaps with a migratory corridor Biologically Important Area (BIA) for NARWs (effective March–April; November–December) that extends from Massachusetts to Florida (LaBrecque *et al.*, 2015). Off the coast of Delaware, this migratory BIA extends from the coast to beyond the shelf break. Due to the fact that the survey activities will be very small relative to the spatial extent of the available migratory habitat in the BIA, right whale migration is not expected to be impacted by the survey. Given the relatively small size of the ensonified

area, it is unlikely that prey availability would be adversely affected by HRG survey operations. Required vessel strike avoidance measures will also decrease risk of ship strike during migration; no ship strike is expected to occur during Orsted's activities. Additionally, only very limited take by Level B harassment of NARW has been requested and is being authorized by NMFS as HRG survey operations are required to maintain a 500 EZ and shutdown if a NARW is sighted at or within the EZ. The 500 m shutdown zone for right whales is conservative, considering the Level B harassment isopleth for the most impactful sources (*i.e.*, GeoMarine Sparkers, AA Dura-spark UHD Sparkers, AA Triple plate S-Boom) is estimated to be 141 m, and thereby minimizes the potential for behavioral harassment of this species. As noted previously, Level A harassment is not expected, nor authorized, due to the small PTS zones associated with HRG equipment types planned for use. NMFS does not anticipate NARW takes that result from the survey activities would impact annual rates of recruitment or survival. Thus, any takes that occur would not result in population level impacts.

Other Marine Mammals With Active UMEs

As noted previously, there are several active UMEs occurring in the vicinity of Orsted's survey area. Elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately half had evidence of human interaction (ship strike or entanglement). The UME does not yet provide cause for concern regarding population-level impacts. Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or DPS) remains stable at approximately 12,000 individuals.

Beginning in January 2017, elevated minke whale strandings have occurred along the Atlantic coast from Maine through South Carolina, with highest numbers in Massachusetts, Maine, and New York. This event does not provide cause for concern regarding population level impacts, as the likely population abundance is greater than 20,000 whales.

The required mitigation measures are expected to reduce the number and/or severity of authorized takes for all species listed in Table 6, including those with active UMEs, to the level of least practicable adverse impact. In particular, they would provide animals

the opportunity to move away from the sound source throughout the survey area before HRG survey equipment reaches full energy, thus preventing them from being exposed to sound levels that have the potential to cause injury (Level A harassment) or more severe Level B harassment. No Level A harassment is anticipated, even in the absence of mitigation measures, or authorized.

NMFS expects that takes would be in the form of short-term Level B behavioral harassment by way of brief startling reactions and/or temporary vacating of the area, or decreased foraging (if such activity was occurring)—reactions that (at the scale and intensity anticipated here) are considered to be of low severity, with no lasting biological consequences. Since both the sources and marine mammals are mobile, animals will only be exposed briefly to a small ensonified area that might result in take. Additionally, the required mitigation measures will further reduce exposure to sound that could result in more severe behavioral harassment.

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

- No mortality or serious injury is anticipated or authorized;
- No Level A harassment (PTS) is anticipated, even in the absence of mitigation measures, or authorized;
- Foraging success is not likely to be significantly impacted as effects on species that serve as prey species for marine mammals from the survey are expected to be minimal;
- The availability of alternate areas of similar habitat value for marine mammals to temporarily vacate the survey area during the planned survey to avoid exposure to sounds from the activity;
- Take is anticipated to be of Level B behavioral harassment only consisting of brief startling reactions and/or temporary avoidance of the survey area;
- While the survey area is within areas noted as a migratory BIA for NARWs, the activities will occur in such a comparatively small area such that any avoidance of the survey area due to activities would not affect migration. In addition, mitigation measures require shutdown at 500 m (almost four times the size of the Level B harassment isopleth (141 m), which minimizes the effects of the take on the species; and

- The mitigation measures, including visual monitoring and shutdowns, are expected to minimize potential impacts to marine mammals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. 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. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS authorizes is below one third of the estimated stock abundance for all species (in fact, take of individuals is less than 5 percent of the abundance of the affected stocks for these species, see Table 6) except for the WNA northern migratory coastal stock of bottlenose dolphins. The figures presented in Table 6 are likely conservative estimates as they assume all takes are of different individual animals which is likely not to be the case. Some individuals may return multiple times in a day, but PSOs will count them as separate takes if they cannot be individually identified. This is the particularly the case for bottlenose dolphins.

As mentioned above, there are two bottlenose dolphin stocks that could occur in the survey area: The WNA Offshore and WNA northern migratory coastal stocks. Given the uncertainty regarding the number of days Orsted's survey may be within the 20 m isobath, the authorization of 2,752 instances of take by Level B harassment is not allocated to a specific stock but rather could be of either stock. However, based on the stocks' respective occurrence in the area and the consideration of

various factors as described below, we have determined that the number of individuals taken will comprise of less than one-third of the best available population abundance estimate of either stock. Detailed descriptions of the stocks' ranges have been provided in the Description of Marine Mammals in the Area of Specified Activities section.

Both the northern migratory and offshore stocks have expansive ranges and are the only dolphin stocks thought to make broad-scale, seasonal migrations in the coastal waters of the North Atlantic. Given the large ranges associated with these two stocks, it is unlikely that large segments of either stock would consistently remain in the survey area. The majority of both stocks are likely to be found widely dispersed across their respective habitat ranges, and individuals within each stock migrate on a seasonal basis.

The northern migratory stock spans from the shelf waters of Florida to Long Island, New York and experience spatiotemporal overlap with several other bottlenose dolphin stocks in the Western North Atlantic. The stock is best defined by its distribution during summer water months (July and August), when it overlaps with the fewest stocks, during which it occupies coastal waters from the shoreline to approximately the 20-m isobath between Assateague, Virginia and Long Island, New York (Hayes *et al.*, 2021). However, during the winter months (e.g., January and February), the stock occupies coastal waters from approximately Cape Lookout, North Carolina to the North Carolina/Virginia border. A study of tagged individuals found that four dolphins off the coast of New Jersey in the late summer moved south to North Carolina and inhabited waters near and just south of Cape Hatteras during cold water months. These animals then returned to the coastal waters of New Jersey in the following warm weather months (Garrison *et al.*, 2017). Additionally, during aerial and ship surveys off the New Jersey coast in 2008 and 2009, no sightings of common bottlenose dolphins were made during November through February, and bottlenose dolphins were sighted from early March to mid-October and were most abundant during May-August. Therefore, the stock is not expected to be present in its entirety year round in the survey area.

Further, many of the dolphin observations in the Delaware Bay and South of Cape May, NJ are likely repeated sightings of the same individuals. A by Toth *et al.*, (2010) conducted 73 boat-based photo-identification surveys in southern New

Jersey near the Bay from 2003–2005 and found that of the 205 individuals identified, 44 percent were sighted multiple times within or among the years. Multiple sightings of the same individual would considerably reduce the number of individual animals that are taken by harassment.

The offshore stock is distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic Ocean from Georges Bank to the Florida Keys (Hayes *et al.*, 2021). There is suspected overlap of the two stocks south of Cape Hatteras, North Carolina to some degree.

In summary and as described above, the following factors primarily support our determination regarding the incidental take of small numbers of the affected stocks of a species or stock:

- The take of marine mammal stocks comprises less than 5 percent of any stock abundance (with the exception of the northern migratory stock of bottlenose dolphins);
- Potential bottlenose dolphin takes in the survey area are likely to be allocated between both distinct stocks;
- Bottlenose dolphin stocks in the survey area have extensive ranges and it would be unlikely to find a high percentage of individuals from either stock concentrated in a relatively small area such as the survey area;
- Many of the takes would likely be repeats of the same animals, especially during summer months.

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

Unmitigable Adverse Impact Analysis and Determination

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

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of

designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS Office of Protected Resources (OPR) consults internally whenever we propose to authorize take for endangered or threatened species.

NMFS is authorizing the incidental take of four species of marine mammals which are listed under the ESA, including the North Atlantic right, fin, sei, and sperm whale, and has determined that these activities fall within the scope of activities analyzed in GARFO's programmatic consultation regarding geophysical surveys along the U.S. Atlantic coast in the three Atlantic Renewable Energy Regions (completed June 29, 2021; revised September 2021). The consultation concluded that NMFS' issuance of incidental take authorization related to these activities are not likely to adversely affect ESA-listed marine mammals.

National Environmental Policy Act

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

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216–6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Authorization

NMFS has issued an IHA to Orsted and its designees for the potential harassment of small numbers of 16 marine mammal species incidental to their marine site characterization survey offshore of Delaware, which includes the previously explained mitigation, monitoring and reporting requirements.

Dated: May 11, 2022.

Kimberly Damon-Randall,

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