DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 217

[Docket No. 240104–0001]

RIN 0648–BL74

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Coastal Virginia Offshore Wind Commercial Project Offshore of Virginia

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

ACTION: Final rule.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA), as amended, NMFS hereby promulgates regulations to govern the incidental taking of marine mammals incidental to the Virginia Electric and Power Company, doing business as Dominion Energy Virginia (Dominion Energy), construction of the Coastal Virginia Offshore Wind Commercial (CVOW–C) Project (hereafter, the CVOW–C Project or the Project) in Federal and State waters offshore of Virginia, specifically within the Bureau of Ocean Energy Management (BOEM) Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS) Lease Area OCS–A 0483 (Lease Area) and along export cable routes to sea-to-shore transition points (collectively referred to as the ''Project Area''), over the course of 5 years (February 5, 2024 through February 4, 2029). These regulations, which allow for the issuance of a Letter of Authorization (LOA) for the incidental take of marine mammals during construction-related activities within the Project Area during the effective dates of the regulations, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat, as well as requirements pertaining to the monitoring and reporting of such taking.

DATES: This rulemaking is effective from February 5, 2024, through February 4, 2029.

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

SUPPLEMENTARY INFORMATION:

Availability

A copy of Dominion Energy's Incidental Take Authorization (ITA) application, supporting documents, received public comments, and the proposed rulemaking, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.* In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Purpose and Need for Regulatory Action

This final rule, as promulgated, provides a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) for NMFS to authorize the take of marine mammals incidental to construction of the Project within the Project Area. NMFS received a request from Dominion Energy to incidentally take 21 species of marine mammals, comprising 22 stocks (7 stocks by Level A harassment and Level B harassment and 15 stocks by Level B harassment only), incidental to Dominion Energy's 5 years of construction activities. No mortality or serious injury is anticipated or authorized in this final rulemaking. Please see the *Legal Authority for the Final Action* section below for definitions of harassment, serious injury, and incidental take.

Legal Authority for the Final Action

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

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). If such findings are made, NMFS must prescribe the permissible methods of taking (*e.g.,* ''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 as ''mitigation'')) and requirements pertaining to the monitoring and reporting of such takings.

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

- *U.S. Citizens*—individual U.S. citizens or any corporation or similar entity if it is organized under the laws of the United States or any governmental unit defined in 16 U.S.C. 1362(13) (50 CFR 216.103);
- *Take*—to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal (16 U.S.C. 1362(13); 50 CFR 216.3);
- *Incidental harassment, incidental taking, and incidental, but not intentional, taking*—an accidental taking. This does not mean that the taking is unexpected, but rather it includes those takings that are infrequent, unavoidable, or accidental (see 50 CFR 216.103);
- *Serious Injury*—any injury that will likely result in mortality (50 CFR 216.3);
- *Level A harassment*—any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild (16 U.S.C. 1362(18); 50 CFR 216.3); and
- *Level B harassment*—any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (16 U.S.C. 1362(18); 50 CFR 216.3).

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

Summary of Major Provisions Within the Final Rule

The major provisions of this final rule are:

- The authorized take of marine mammals by Level A harassment and/or Level B harassment;
- No authorized take of marine mammals by mortality or serious injury;

- The establishment of a seasonal moratorium on pile driving of foundation piles during the months of the highest presence of North Atlantic right whales (*Eubalaena glacialis*) in the Lease Area (November 1st through April 30th, annually);
- A requirement for both visual and passive acoustic monitoring to occur by NOAA Fisheries-approved Protected Species Observers (PSOs) and Passive Acoustic Monitoring (PAM) operators (where required) before, during, and after select activities;
- A requirement of training for all Dominion Energy personnel to ensure marine mammal protocols and procedures are understood;
- The establishment of clearance and shutdown zones for all in-water construction activities to prevent or reduce the risk of Level A harassment and to minimize the risk of Level B harassment;
- A requirement to use sound attenuation devices during all foundation pile driving installation activities to reduce noise levels to those modeled assuming 10 decibels (dB);
- A delay to the start of foundation installation if a North Atlantic right whale is observed at any distance by PSOs or acoustically detected within the PAM Monitoring Zone (10 kilometer (km));
- A delay to the start of foundation installation if other marine mammals are observed entering or within their respective clearance zones;
- A requirement to shut down pile driving (if feasible) if a North Atlantic right whale is observed at any distance or if any other marine mammals are observed entering their respective shutdown zones;
- A requirement to conduct sound field verification (SFV) during foundation pile driving to measure *in-situ* noise levels for comparison against the modeled results;
- A requirement to implement soft-starts during impact pile driving using the least amount of hammer energy necessary for installation;
- A requirement to implement ramp-up during the use of high-resolution geophysical (HRG) marine site characterization survey equipment;
- A requirement to monitor relevant Right Whale Sightings Advisory System and Channel 16, as well as reporting any sightings to the sighting network;
- A requirement to implement various vessel strike avoidance measures;
- A requirement to implement measures during fisheries monitoring surveys, such as removing gear from the water if marine mammals are considered at-risk or are interacting with gear; and
- A requirement to submit frequently scheduled and situational reports including, but not limited to, information regarding activities occurring, marine mammal observations and acoustic detections, and sound field verification monitoring results.

NMFS must withdraw or suspend any LOA issued under these regulations, after notice and opportunity for public comment, if it finds the methods of taking or the mitigation, monitoring, or reporting measures are not being substantially complied with (16 U.S.C. 1371(a)(5)(B); 50 CFR 216.206(e)). Additionally, failure to comply with the requirements of the LOA may result in civil monetary penalties and knowing violations may result in criminal penalties (16 U.S.C. 1375; 50 CFR 216.206(g)).

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

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

Dominion Energy's project is listed on the Permitting Dashboard, where milestones and schedules related to the environmental review and permitting for the Project can be found at *https://www.permits.performance.gov/permitting-project/fast-41-covered-projects/coastal-virginia-offshore-wind-commercial-project.*

Summary of Request

On February 16, 2022, Dominion Energy submitted a request for the promulgation of regulations and issuance of an associated LOA to take marine mammals incidental to construction activities associated with the Project. The request was for the incidental, but not intentional, taking of a small number of 21 marine mammal species (comprising 22 stocks) by Level B harassment (all 22 stocks) and by Level A harassment (7 species or stocks). Dominion Energy did not request, and NMFS neither expects nor authorizes, incidental take by serious injury or mortality.

In response to our questions and comments and following extensive information exchange between Dominion Energy and NMFS, Dominion Energy submitted a final revised application on August 5, 2022. NMFS deemed it adequate and complete on August 12, 2022. This final application is available on NMFS' website at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.*

On September 15, 2022, NMFS published a notice of receipt (NOR) of Dominion Energy's adequate and complete application in the **Federal Register** (87 FR 56634), requesting public comments and information on Dominion Energy's request during a 30-day public comment period. During the NOR public comment period, NMFS received a single comment letter from an environmental non-governmental organization: the Southern Environmental Law Center (SELC). We also received a single comment from a government agency: the United States Geological Survey. These comments entailed broader comments very similar to those we received during the proposed notice's comment period, including, but not limited to: vessel strike avoidance measures; the use of best available science when evaluating a seasonal pile driving moratorium; suggestions on proposed clearance and shutdown (termed ''exclusion'') zones for North Atlantic right whales; cumulative impacts; and additional suggested mitigation, monitoring, and reporting measures in a supplemental attachment provided by the commenter. In June 2022, Duke University's Marine Spatial Ecology Laboratory released updated habitat-based marine mammal density models (Roberts *et al.,* 2023). Because Dominion Energy applied marine mammal densities to their analysis in their application, Dominion Energy submitted a final Updated Density and Take Estimation Memo (herein referred to as Updated Density and Take Estimation Memo) on January 10, 2023 that included marine mammal densities and take estimates based on these new models which NMFS posted on our website in May 2023.

In January 2023, BOEM informed NMFS that the proposed activity had changed from what is presented in the adequate and complete MMPA application. Specifically, the changed proposed activity involved the reduction of maximum wind turbine generators (WTGs) built (from 205 to 202 WTGs) as under the original Project Design Envelope (PDE) and the offshore substations (OSSs) would be located in the vessel transit routes. Under the 202

build-out, three WTGs would be removed and the three OSSs would be shifted into these WTG positions. However, in late January 2023, Dominion Energy confirmed that their Preferred Layout of 176 WTGs is the base case for construction, but that they could possibly need up to 7 WTGs re-piled in alternate positions due to unstable sediment conditions, which could necessitate up to 183 independent piling events. WTG positions have been removed from consideration for one or more of the following reasons: impracticable due to foundation technical design risk, shallow gas presence, commercial shipping and navigation risk concerns, erosion risk, and presence of a designated fish haven. Based on the information provided, NMFS carried forward the analysis assuming a total build-out of 176 WTGs plus seven re-piled WTGs (a total of 183 independent piling events for WTGs) and the 3 originally planned OSSs. Due to the significant reduction of turbines from the original proposed action found in the adequate and complete ITA application (reduction of approximately 14 percent), Dominion Energy, in consultation with NMFS, provided an updated proposed action summary, revised exposure estimates, revised take requests, and an updated piling schedule in mid-February 2023 (hereinafter referred to as the Revised Proposed Action Memo). NMFS posted this to our website in May 2023.

On May 4, 2023, NMFS published a proposed rule in the **Federal Register** for the CVOW–C Project (88 FR 28656). In the proposed rule, NMFS synthesized all of the information provided by Dominion Energy, all best available scientific information and literature relevant to the proposed project, outlined, in detail, proposed mitigation designed to effect the least practicable adverse impacts on marine mammal species and stocks as well as proposed monitoring and reporting measures, and made preliminary negligible impact and small numbers determinations. The public comment period on the proposed rule was open for 30 days on *https://www.regulations.gov* starting on May 4, 2023 and closed after June 5, 2023. The public comments can be viewed at *https://www.regulations.gov/docket/NOAA-NMFS-2023-0030;* a summary of public comments received during this 30-day period and NMFS responses are described in the Comments and Responses section.

NMFS has previously issued six Incidental Harassment Authorizations (IHAs) to Dominion Energy. Two of those IHAs, issued in 2018 (83 FR 39062, August 8, 2018) and 2020 (85 FR 30930, May 21, 2020) supported the development of the Coastal Virginia Offshore Wind project, known as the CVOW Pilot Project (wherein two turbines were constructed). The remaining four IHAs (two of which were modified IHAs) were high resolution site characterization surveys within and around the CVOW–C Lease Area (see 85 FR 55415, September 8, 2020; 85 FR 81879, December 17, 2020; 86 FR 21298, April 22, 2021; and 87 FR 33730, June 3, 2022). To date, Dominion Energy has complied with all the requirements (*e.g.,* mitigation, monitoring, and reporting) of the previous IHAs and information regarding their monitoring results may be found in the Estimated Take section. These monitoring reports can be found on NMFS' website: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.*

On August 1, 2022, NMFS announced proposed changes to the existing North Atlantic right whale vessel speed regulations (87 FR 46921, August 1, 2022) to further reduce the likelihood of mortalities and serious injuries to endangered right whales from vessel collisions, which are a leading cause of the species' decline and a primary factor in an ongoing Unusual Mortality Event (UME). Should a final vessel speed rule be issued and become effective during the effective period of these regulations (or any other MMPA incidental take authorization), the authorization holder will be required to comply with any and all applicable requirements contained within the final vessel speed rule. Specifically, where measures in any final vessel speed rule are more protective or restrictive than those in this or any other MMPA authorization, authorization holders will be required to comply with the requirements of the vessel speed rule. Alternatively, where measures in this or any other MMPA authorization are more restrictive or protective than those in any final vessel speed rule, the measures in the MMPA authorization will remain in place. The responsibility to comply with the applicable requirements of any vessel speed rule will become effective immediately upon the effective date of any final vessel speed rule, and when notice is published on the effective date, NMFS will also notify Dominion Energy if the measures in the vessel speed rule were to supersede any of the measures in the MMPA authorization.

Description of the Specified Activities

Overview

Dominion Energy plans to construct and operate the Project, a 2,500 to 3,000-megawatt (MW) offshore wind farm, in the Project Area. The Project will allow the Commonwealth of Virginia to meet its renewable energy goals under the Virginia Clean Economy Act (HB 1526/SB 851).

Dominion Energy's precursor pilot project (*i.e.,* CVOW Pilot Project) was a 12 MW, two-turbine test project and the first to be installed in Federal waters. Designed as a research/test project, the two turbines associated with the CVOW Pilot Project became operational in October 2020 approximately 27 miles (mi; 43.45 kilometers (km)) off of Virginia Beach, Virginia. Information on this Pilot Project was used to inform the CVOW–C project. More information on the Pilot Project can be found on BOEM's website (*https://www.boem.gov/renewable-energy/state-activities/coastal-virginia-offshore-wind-project-cvow*) and in the IHA authorized by NMFS in May 2020 for BOEM Lease Area OCS–A–0497 (*https://www.bfisheries.bnoaa.bgov/action/incidental-take-authorization-dominion-energy-virginia-offshore-wind-construction-activities*).

The Project will consist of several different types of permanent offshore infrastructure, including 176 WTGs (*e.g.,* the Siemens Gamesa SG–14–222 DD 14–MW model with power boost technology potentially allowing up to 14.7–MW, equating to a total of 2,587.2–MW for full build-out) and associated foundations, three OSSs, offshore substation array cables, offshore export cables, and substation interconnector cables. Overall, Dominion Energy will conduct the following specified activities: install 176 WTGs and 3 OSS on monopile foundations via vibratory and impact pile driving; install and subsequently remove up to 9 cofferdams, by vibratory pile driving, and install up to 108 goal posts (12 goal posts for each of 9 Direct Pipe locations), by impact pile driving, to assist in the installation of the export cable; conduct several types of fishery and ecological monitoring surveys; place scour protection; trenching, laying, and burial activities associated with the installation of the export cable from OSSs to shore-based converter stations and inter-array cables between turbines; conduct HRG vessel-based site characterization surveys using active acoustic sources with frequencies of less than 180 kilohertz (kHz); transit within the Project Area and between ports and the Lease Area to transport crew,

supplies, and materials to support construction activities; and WTG operation. From the sea-to-shore transition point, onshore underground export cables are then connected in series to switching stations/substations, overhead transmission lines, and ultimately to the grid connection, which will be located in a parking lot found west of the firing range at the State Military Reservation located in Virginia Beach, Virginia.

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

A detailed description of the specified activities is provided in the proposed rule as published in the **Federal Register** (88 FR 28656, May 4, 2023). Since the proposed rule was published, Dominion Energy has not modified the specified activities. Please refer to the proposed rule for more information on the description of the specified activities.

Dates and Duration

Dominion Energy anticipates its specified activities to occur throughout all 5 years of the effective period of the regulations, beginning on February 5, 2024 and continuing through February 4, 2029. Dominion Energy's anticipated construction schedule can be found in Table 1. Dominion Energy has noted that these are the best, and conservative, estimates for activity durations but that the schedule may shift due to weather, mechanical, or other related delays.

TABLE 1—CONSTRUCTION SCHEDULE [a]

Project activity	Expected timing	Expected duration (approximate)
Scour Protection Pre-Installation	Q2 through Q4 of 2024	9 months.
	Q2 through Q4 of 2025	9 months.
WTG Foundation Installation [b e]	Q2 through Q4 of 2024	6 months.
	Q2 through Q4 of 2025	6 months.
Scour Protection Post-installation	Q2 through Q4 of 2024	9 months.
	Q2 through Q4 of 2025	9 months.
OSS Foundation Installation [b e]	Q2 through Q4 of 2024	6 months.
	Q2 through Q4 of 2025	6 months.
Cable Landfall Construction (Goal Posts and Cofferdams) [h]	Q1 through Q4 of 2024	6 months.
HRG Surveys [c d]	Q1 2024 through Q4 2028	Any time of year.
Site Preparation	Q1 2024 through Q2 2024	6 months.
Inter-array Cable Installation	Q2 2025 through Q4 2026	19 months.
Export Cable Installation	Q3 2024 through Q3 2025	14 months.
Fishery Monitoring Surveys: [f g]		
Surf Clam	Q2 2023	1 week.
Whelk	Q2 2023 through Q1 2025	24 months.
Black Sea Bass	Q2 2023 through Q1 2025	24 months.

Note: "Q1, Q2, Q3, and Q4" each refer to a quarter of the year, starting in January and comprising 3 months each. Therefore, Q1 represents January through March, Q2 represents April through June, Q3 represents July through September, and Q4 represents October through December.

[a] While the effective period of the final regulations would extend a few months into 2029, no activities are planned to occur in 2029 by Dominion Energy, so these were not included in this table.

[b] Activities would only occur from May 1st through October 31st annually.

[c] Activities would begin in February 2024, upon the issuance of an associated LOA, and continue through construction and post-construction.

[d] For HRG surveys, Dominion Energy anticipates up to 65 days of surveys would occur during the pre-construction period (2024), up to 307 days during the primary construction years (2025 and 2026), and up to 736 days would be needed during the post-construction years (2027 and 2028) with a 50/50 split of 368 days each year. No surveys are planned for 2029.

[e] Dominion Energy anticipates that all WTGs and OSS foundations will be installed by October 31, 2025; however, unanticipated delays may require some foundation pile driving to occur in 2026 and/or 2027.

[f] Some fishery monitoring survey activities are planned prior to February 2024 but are not included here as they would not occur during the effective dates of the rule and an associated LOA.

[g] Dates displayed here are for field work, as that would be the only component that could impact marine mammals.

[h] Although cable landfall activities are anticipated to occur over 9–12 months total, activities capable of harassing marine mammals would only occur for the specified duration described here as other activities necessary for landfall construction (*i.e.,* area preparation, material transportation, etc.) would also occur.

Specified Geographic Region

A detailed description of the Specified Geographic Region is provided in the proposed rule as published in the **Federal Register** (88 FR 28656, May 4, 2023). Since the proposed rule was published, no changes have been made to the Specified Geographic Region. Generally, Dominion Energy's specified activities (*i.e.,* vibratory and impact pile driving of WTGs on monopile and OSS on jacket foundations; vibratory pile driving (installation and removal) of temporary cofferdams; impact pile driving (installation) of goal posts; placement of scour protection; trenching, laying, and burial activities associated with the installation of the export cable and inter-array cables; HRG site characterization surveys; and WTG operation) are concentrated in the Project Area (Figure 1). A couple of Dominion Energy's specified activities (*i.e.,* fishery and ecological monitoring surveys and transport vessels) will occur in the Mid-Atlantic Bight.

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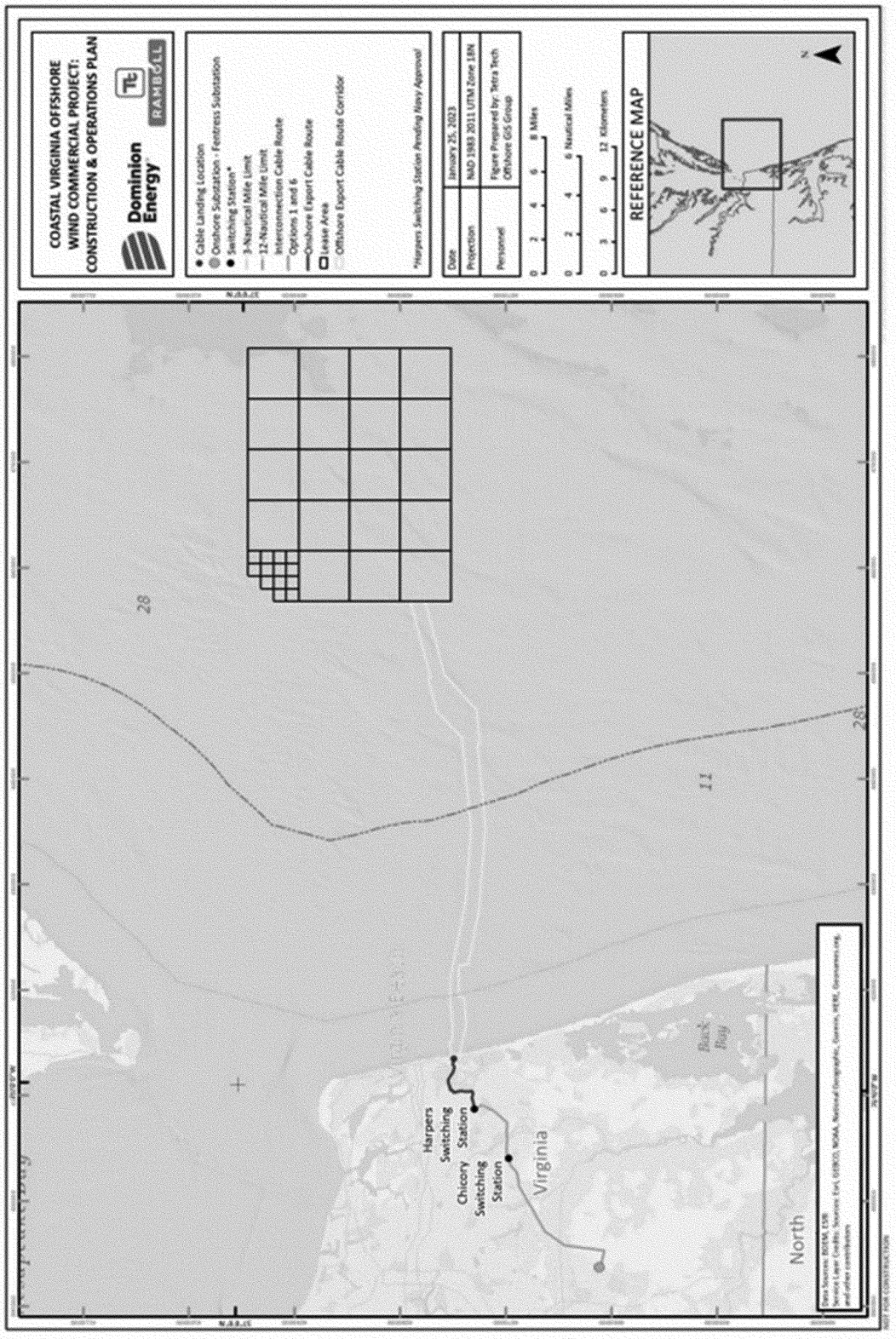
Figure 1—Project Area



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Comments and Responses

A notice of proposed rulemaking was published in the **Federal Register** on May 4, 2023 (88 FR 28656). The proposed rulemaking described, in detail, Dominion Energy's specified activities, the specified geographic region of the specified activities, the

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

In total, NMFS received 169 comment submissions, comprising 161 individual comments from private citizens and 6 comment letters from organizations or public groups including, but not limited to: the Marine Mammal Commission (the Commission), Oceana, Inc. (Oceana), SELC, Responsible Offshore Development Alliance (RODA), West Coast Pelagic Conservation Group (WCPCG); and the Virginia Department of Wildlife Resources (VDWR). Some of the comments received are considered out-of-scope, including, but not limited to, comments related to the non-offshore wind farm development; concerns for other species outside of NMFS' jurisdiction (*i.e.,* birds, tortoises, bats, insects); costs associated with offshore wind development; recycling of turbine components; national security concerns; other projects that are not the CVOW–C Project; and project decommissioning, which would occur outside the effective period of this rule. These comments are not described herein or discussed further. Moreover, where comments recommended that the final rule include mitigation, monitoring, or reporting measures that were already included in the proposed rule and such measures are carried forward in this final rule, they are not included here, as those comments did not raise significant points for NMFS to consider. Furthermore, if a comment received was unclear, we do not include it here as we could not determine whether it raised a significant point for NMFS to consider. NMFS also received a comment letter from Gatzke Dillion & Ballance LLP on behalf of the Committee for a Constructive Tomorrow (CFACT), the American Coalition for Ocean Protection (ACOP), and the Heartland Institute after the close of the public comment period.

The six letters (*i.e.,* Oceana, RODA, WCPCG, SELC, VDWR, and the Commission), as well as individual comments, received during the public comment period contained significant points that NMFS considered in its estimated take analysis, including: required mitigation, monitoring, and reporting measures; final determinations; and final regulations. These are described and responded to below. All substantive comments and letters are available on NMFS' website: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act.* Please review the corresponding public comment link for full details regarding the comments and letters.

Modeling and Take Estimates

Comment 1: The Commission claimed NMFS ''underestimated the numbers of Level A harassment and Level B harassment takes (including failing to round up to group size) . . .'' Specifically, the Commission claimed NMFS underestimated the number of takes for harbor seals because harbor seals occur in much greater numbers than gray seals off Virginia (*see* Jones and Rees, 2022).

Response: NMFS incorporated group size into the estimated take analysis (*see* the Estimated Take of Marine Mammals section in the proposed rule (88 FR 28656, May 4, 2023) and Estimated Take section of this final rule). The Commission did not provide specific recommendations to adjust any take estimates other than for harbor and gray seals. NMFS has reviewed the number of takes by Level A harassment and Level B harassment for all species and disagrees it is an underestimate.

While the Commission does indeed cite a relevant paper, Jones and Rees (2022), as the basis for their observation, NMFS does not believe this paper alone is enough justification for adjusting take. The study sites in Jones and Rees (2022) are not applicable to Dominion Energy's activities (*i.e.,* they are located in estuarine habitat) as NMFS does not expect these specific areas to be impacted by the construction work for CVOW–C.

Specifically in addressing the Commission's concerns with the 50/50 allocation of take for pinnipeds between each species, NMFS disagrees that this method is incorrect and that this approach over- or under-estimates take. The Duke University density models (Roberts *et al.,* 2023) group some species together (including phocid seals) to provide a single density estimate. While we acknowledge that more harbor seals have been observed in inland Chesapeake Bay waters than gray seals, there is not sufficient at-sea data to better proportion the number of takes by species; therefore, we assumed a 50/50 split consistent with Roberts *et al.* (2023). Importantly, for each species, we believe the maximum number of takes authorized in any given year (n=84 for each species) is a reasonable estimate of the number of harassment takes that may occur incidental to the specified activities given the majority of work that may result in marine mammal harassment would be occurring during times (May 1st through October 31st) when seals are less likely to be present in Virginia waters. For these reasons, we disagree with the Commission's claim and have not modified the take estimate approach in this final rule.

Comment 2: A commenter disagreed with NMFS' preliminary small numbers determination based on the sum of takes for all species.

Response: Under the MMPA, the Secretary of Commerce, as delegated to NMFS, shall allow the incidental taking of ''small numbers of marine mammals *of a species or population stock*'' if specific findings are made (16 U.S.C. 1371(a)(5)(a)(i)). Thus, the small numbers finding is done at the species or population level. In practice, where estimated numbers are available, NMFS compares the number of individuals estimated to be taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. NMFS has made the necessary small numbers finding for all affected species and stocks.

Comment 3: A commenter stated that there is the potential for repeated exposures to adversely affect species' or stocks' annual rates of recruitment or survival.

Response: NMFS fully considered the potential for repeated exposures in the proposed rule and this final rule when determining if the specified activities would result in a negligible impact to the affected species and stocks. The Negligible Impact Analysis and Determination section in both the proposed and final rules discusses the potential for repeated exposures and the potential related impacts. As described in those sections, NMFS has determined that the impacts resulting from the specified activities (recognizing that the potential for repeated exposures varies with the species due to habitat use (*e.g.,* migrating whales versus species that may remain in the area over longer periods of time)), will have a negligible impact on the affected species and stocks.

Comment 4: Commenters stated that there is no evidence or research proving that the CVOW–C Project would not cause the mortality or serious injury of marine mammals. The commenters further stated that there is no evidence proving that the estimated take

proposed by NMFS in the proposed rule is accurate or the maximum total.

Response: Regarding take by serious injury or mortality, the proposed rule clearly states that no serious injury and/or mortality is expected or proposed for authorization, and the same carries into the final rule for which no take by serious injury or mortality has been authorized (*see also* 50 CFR 217.292(c)).

Regarding the claim that there is no evidence proving the take estimates are accurate, the take numbers, as shown in the proposed and final rule, are based on the best available marine mammal density data, published and peer reviewed scientific literature, on-the-water reports from other nearby projects or past MMPA actions, and highly complex statistical models of which real-world assumptions and inputs have been incorporated to estimate on a project-by-project basis. In the Estimated Take section, NMFS has provided detailed rationale for why the number and manner of takes authorized in this final rule are reasonable and based on the best available science. The commenter did not provide any information to support their claim that take estimates are not representative of the take that may occur incidental to the project. NMFS disagrees with the commenter and expects that the take numbers authorized for this action are sufficient given the activity proposed and planned by Dominion Energy.

Mitigation

Comment 5: The commenter stated that the LOA must include conditions for the survey and construction activities that will first avoid adverse effects on North Atlantic right whales in and around the area and then minimize and mitigate the effects that cannot be avoided. This should include a full assessment of which activities, technologies and strategies are truly necessary to achieve site characterization and construction to inform development of the offshore wind projects and which are not critical, asserting that NMFS should prescribe the most appropriate techniques that would produce the lowest impact while achieving the same goals while prohibiting those other tools/techniques that would cause more frequent, intense, or long-lasting effects.

Response: The MMPA requires that we include measures that will effect the least practicable adverse impact on the affected species and stocks and, in practice, NMFS agrees that the rule should include conditions for the construction activities that will first avoid adverse effects on North Atlantic right whales in and around the project area, where practicable, and then minimize the effects that cannot be avoided. NMFS has determined that this final rule meets this requirement to effect the least practicable adverse impact. The commenter does not make any specific recommendations of measures to add to the rulemaking.

NMFS is required to authorize the requested incidental take if it finds such incidental take of small numbers of marine mammals by the requestor while engaging in the specified activities within the specified geographic region will have a negligible impact on such species or stock and, where relevant, will not have an unmitigable adverse impact on the availability of such species or stock for subsistence uses. As described in this notice of final rulemaking, NMFS finds that small numbers of marine mammals may be taken relative to the population size of the affected species or stocks and that the incidental take of marine mammal from all of Dominion Energy's specified activities combined will have a negligible impact on all affected marine mammal species or stocks. It is not within NMFS' authority to determine if the requestor's specified activities are truly necessary or critical; however, NMFS does identify and has required in this final rule mitigation measures the effect the least practicable adverse impact on marine mammals.

Comment 6: The commenter stated that the LOA should use buffer zones to avoid any effects of turbine presence on North Atlantic right whales and foraging.

Response: Buffer zones have been suggested to mitigate impacts from offshore wind related activities near areas of significance (*e.g.,* known feeding grounds). As described in the proposed rule and herein, the project area, located offshore Virginia, is not considered foraging habitat and while some opportunistic foraging may occur, it is primarily a migratory corridor. Therefore, NMFS disagrees that a new mitigation measure creating a buffer zone is necessary to effect the least practicable adverse impact on North Atlantic right whales.

Comment 7: One commenter recommended that NMFS require clearance and shutdown zones for all protected species that included (1) a minimum of 5,000 m (3.1 mi) for the visual and acoustic clearance zones; and (2) an acoustic shutdown zone that would extend at least 2,000 m (1.2 mi) in all directions from the driven pile location. Commenters also recommended that NMFS require pile-driving clearance and shutdown zones for large whales (other than North Atlantic right whale) that are large enough to avoid all take by Level A harassment and minimize Level B harassment to the most practicable extent.

Response: The required shutdown and clearance zones (equally sized) for large whales (other than North Atlantic right whale) are based on the largest Level A harassment exposure range calculated for a mysticete, other than humpback whales, rounded up to the nearest hundred for PSO clarity. For all other species (*e.g.,* dolphins, harbor porpoise, seals), clearance and shutdown zones have been developed in consideration of modeled distances to relevant PTS thresholds with respect to minimizing the potential for take by Level A harassment, which were rounded up for PSO clarity. NMFS has determined that these zone sizes effect the least practicable adverse impact on marine mammals. Further, delaying the project unnecessarily due to very large clearance and shutdown zones could have unintended adverse impacts on marine mammals by extending the construction schedule. The commenters do not provide additional scientific information to support their suggestion to expand clearance and shutdown zones to the distances recommended. NMFS has not incorporated this recommendation into this final rule.

NMFS agrees that mitigation measures should be designed to avoid and minimize the potential for PTS and has included such measures in this rulemaking to effect the least practicable adverse impact on marine mammals. Specifically, in addition to requiring shutdown of pile driving if North Atlantic right whales are detected at any distance, NMFS has identified and required reasonable mitigation measures to avoid or minimize adverse impacts to marine mammals, such as setting this Project's impact pile driving clearance zones to be larger than the Level A harassment (PTS) zones for all other large whale species. NMFS believes that these measures are effective and would result in avoiding (North Atlantic right whale) or minimizing (other large whales) the takes by Level A harassment. We anticipate that where there is potential for Level A harassment, any auditory injury will be minimized through the implementation of noise abatement, soft starts, and clearance and shutdown zones. NMFS has made its required negligible impact finding based on the amount of take that may be authorized in the LOA.

NMFS agrees with the commenter that impacts should be minimized to the maximum extent practicable and we have done so with the required

mitigation measures. Enlargement of these zones is not practicable as it could interrupt and delay the project such that construction activities would occur over longer timeframes, which would incur additional costs but, importantly, also potentially increase the number of days that marine mammals are exposed to the disturbance. Conducting activities as expeditiously as possible when large whales are less likely to occur in the area is a means by which to minimize harassment. Accordingly, NMFS has determined that enlargement of these zones is not warranted, and that the existing required clearance and shutdown zones support a suite of measures that will effect the least practicable adverse impact on other large whales.

Comment 8: A commenter recommended that, to protect all protected species, NMFS should restrict pile driving at night while another recommended pile driving should only be allowed to continue after dark if the activity was started during daylight hours and must continue due to human safety or installation feasibility (*i.e.,* stability) concerns, but that nighttime monitoring protocols be required. A commenter suggested that if pile driving must continue after dark, Dominion Energy should be required to notify NMFS with these reasons and an explanation for exemption and that a summary of the frequency of these exceptions must be made publicly available to ensure that these are indeed exceptions, rather than the norm, for the project.

Response: Dominion Energy did not request, and NMFS did not evaluate, nighttime pile driving except in the following circumstance. In the proposed rule, we indicated that Dominion Energy must initiate pile driving prior to 1.5 hours before civil sunset and not before 1 hour after civil sunrise unless they submit to NMFS, for approval, an Alternative Monitoring Plan for nighttime pile driving activities. Within the final regulations and consistent with the commenter's recommendation, Dominion Energy will be allowed, due to safety and stability concerns, to finish piles at night when the pile has been started during daylight hours, in which they still must provide an Alternative Monitoring Plan for NMFS review and approval to ensure that they can appropriately monitor and mitigate for marine mammals in reduced visibility conditions. This Plan will describe the alternative monitoring technologies that would be used to observe for marine mammals, which as described in the proposed rule and carried over into the final rule, includes technologies such as infrared or thermal cameras, that are considered practical in low-light conditions and other periods of reduced visibility to allow for the continuation of monitoring the applicable clearance and shutdown zones. This Alternative Monitoring Plan is also applicable to reduced visibility conditions.

Regarding the reporting requirement specified by the commenter, required weekly and monthly reports during foundation installation must contain information that would inform how long and when pile driving occurred, as Dominion Energy is required to document the daily start and stop times of all pile-driving activities. At minimum, a final annual report with this information will be made available to the public, as recommended by the commenter.

Comment 9: Given the potential of the project to increase the vessel traffic in and around the project area, a commenter suggests that the regulations include a vessel traffic plan to minimize the effects of service vessels on marine wildlife and include the following requirements for all project vessels, regardless of their function, ownership, or operator, to further reduce impacts to marine mammals: (1) all vessels associated with the proposed construction should be required to carry and use PSOs at all times when under way; and (2) limit all vessels, regardless of size, to speeds less than 10 knots (kn) at all times with no exceptions allowed. Alternatively, commenters suggest that project proponents could work with NMFS to develop an ''Adaptive Plan'' that modifies vessel speed restrictions if the monitoring methods informing the Adaptive Plan are proven as effective when for vessels traveling 10 kn or less and must follow a scientific study design. One commenter further suggested that if the Adaptive Plan is scientifically proven to be equally or more effective than a 10-kn speed restriction, that the Adaptive Plan could be used as an alternative to the 10-kn speed restriction. Identical or similar vessel mitigation measures were suggested by others.

Response: Dominion Energy is required to abide by a suite of vessel strike avoidance measures that include, for example, seasonal and dynamic vessel speed restrictions to 10 kn (18.5 km/hour) or less; required use of dedicated observers (*i.e.,* visual PSOs during construction activities or trained lookouts during vessel transit) on all transiting vessels; and a requirement to maintain awareness of North Atlantic right whale presence and occurrence through monitoring of North Atlantic right whale sighting systems (*i.e.,* RWSAS, U.S. Coast Guard Channel 16, the establishment of any Dynamic Management Areas (DMAs)). Additionally, as included in the proposed rule and required in this final rule, Dominion Energy is required to submit a North Atlantic Right Whale Vessel Strike Avoidance Plan to NMFS for review and approval (*see* § 217.294(b)(16)). While a year-round 10-kn requirement could potentially fractionally reduce the already discountable probability of a vessel strike, this theoretical reduction is not expected to manifest in measurable real-world differences in impact. Further, additional limitations on speed have significant practicability impacts on applicants, in that, given the distance of CVOW–C's Lease Area offshore of Virginia, vessels trips to and from shore would significantly increase in duration to the extent that delays to the project and planned construction schedule would be likely to occur resulting in impracticable economic and resource (*e.g.,* vessel availability) constraints. Additionally, requiring a PSO on all transiting vessels (in lieu of trained crew members) also contribute to unnecessary and impracticable economic and resources issues (as space on vessels is limited), which could also extend the number of days necessary to complete all pile driving of foundations. While NMFS is requiring a dedicated observer to be aboard all transiting vessels, we find a dedicated trained crew member is sufficient to observe for marine mammals, particularly large whales, to further reduce risk of vessel strike. Furthermore, Dominion Energy has committed to the use of PAM within the vessel transit corridor to further aid in the detection of marine mammals. NMFS has determined that these and other included measures ensure the least practicable adverse impact on species or stocks and their habitat. Therefore, we are not requiring project-related vessels to travel 10 kn or less at all times.

Regarding an ''Adaptive Plan'', the proposed rule and this final rule contain adaptive management provisions that allows NMFS to modify mitigation, monitoring, or reporting measures if doing so creates a reasonable likelihood of more effectively accomplishing the goal(s) of the measure (*see* § 217.297(c)). Dominion Energy may also request modifications to the mitigation and monitoring measures (*see* § 217.297(a)–(b)). Therefore, NMFS disagrees that an Adaptive Plan is necessary to affect the least practicable adverse impact on marine mammals.

Comment 10: Commenters recommended that NMFS require

Dominion Energy to implement the best, commercially available combined NAS technology to achieve the greatest level of noise reduction and attenuation possible for pile driving, with a specific recommendation that NMFS require, at a minimum, a 10-dB reduction in SEL. The commenter further stated that NMFS should require field measurements to be taken throughout the construction process, including on the first pile installed, to ensure compliance with noise reduction requirements.

Response: NMFS agrees with the suggestion made by the commenters that underwater noise levels should be reduced to the greatest degree practicable to reduce impacts on marine mammals. As described in both the proposed and final rule, NMFS has included requirements for sound attenuation methods that successfully (evidenced by required sound field verification measurements) reduce real-world noise levels produced by impact pile driving of foundation installation to, at a minimum, the levels modeled assuming 10-dB reduction, as analyzed in this rulemaking. Preliminary sound measurements from South Fork Wind indicate that with multiple NAS systems, measured sound levels during impact driving foundation piles using a 4,000 kilojoules (kJ) hammer are below those modeled assuming a 10-dB reduction and suggest, in fact, that two systems may sometimes be necessary to reach the targeted 10-dB reductions. While NMFS is requiring that Dominion Energy reduce sound levels to at or below the model outputs analyzed (assuming a reduction of 10 dB), we are not requiring greater reduction as it is currently unclear (based on measurements to date) whether greater reductions are consistently practicable for these activities, even if multiple NAS systems are used.

In response to the recommendation by the commenters for NMFS to confirm that a 10-dB reduction is achieved, NMFS clarifies that, because no unattenuated piles would be driven, there is no way to confirm a 10-dB reduction; rather, *in-situ* SFV measurements will be required to confirm that sound levels are at or below those modeled assuming a 10-dB reduction.

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

Comment 11: Commenters recommended that, for HRG surveys, NMFS require the use of PAM and include a 1,000-m (0.62-mi) acoustic clearance zone for North Atlantic right whales and also increase the visual clearance zone to 1,000 m for right whales. Another commenter recommended that NMFS increase the size of the visual clearance and shutdown zones during HRG surveys to 500 m (0.31 mi) for all other large whales. They also suggested that HRG surveys should be halted or shut down if North Atlantic right whales or other large whales are acoustically detected.

One commenter who also supported PAM during HRG surveys, stated that the real-time PAM system should be capable of detecting protected species at least 10,000 m (6.2 mi) and would be undertaken by a vessel other than the pile driving vessel or from a stationary unit to avoid masking effects of the hydrophone. The commenter also suggested that PAM be used during all impact pile driving, during vibratory pile driving of the cofferdams, and during HRG surveys.

Response: NMFS disagrees PAM is necessary during HRG surveys. While NMFS agrees that PAM can be an important tool for augmenting detection capabilities in certain circumstances, its utility in further reducing impacts during HRG survey activities is limited. First, it is generally accepted that, even in the absence of additional acoustic sources, using a towed passive acoustic sensor to detect baleen whales (including North Atlantic right whales) 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 µPa (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).

Second, for HRG surveys, the area expected to be ensonified above the Level B harassment threshold is relatively small (a maximum of 100 m via the GeoMarine Dual 400 Sparker at 800 joules); this reflects the fact that the source level is comparatively low and the intensity of any resulting impacts would be lower level. Further, the small harassment zone (and 500 m clearance and shutdown zones) are likely to be effectively monitored via visual means and PAM will only detect a portion of any animals exposed within these small zones. Together these factors support the limited value of PAM for use in reducing take with smaller zones.

NMFS also disagrees that the zones for North Atlantic right whales and other large whales should be expanded. As described in the proposed and final rules, the required 500-m clearance zone for North Atlantic right whales exceeds the modeled distance to the largest 160-dB Level B harassment isopleth (100 m (0.06 mi) during sparker use) by a large margin, minimizing the likelihood that they will be harassed in any manner by this activity. The 500-m distance is five times the estimated isopleth for the largest 160-dB Level B harassment threshold and we do not see a need to increase this further. Further, the commenters do not provide scientific information for NMFS to consider to support their recommendation to expand the clearance zone. As such, NMFS recognizes that requiring zones beyond those that meet the least practicable adverse impact standard could delay the project such that construction activities are extended to

the point that it is actually less beneficial for the species. Given that these surveys are relatively low impact, and that NMFS has prescribed a precautionary North Atlantic right whale clearance zone that is larger (500 m) than the largest estimated harassment zone (100 m), NMFS has determined that an increase in the size of the clearance and shutdown zones for North Atlantic right whales to 1,000 m is not warranted or practicable and the commenter does not provide new information supporting this comment. Similarly, increasing the size of the clearance and shutdown zones for other large whales to 500 m during HRG surveys is also not warranted or practicable and the commenter does not provide new information supporting this comment.

Regarding the use of PAM during cable landfall construction, although distances above the Level B harassment threshold are larger than for HRG surveys (3,100 m for temporary cofferdams and 1,450 m for temporary goal posts), the effects are not expected to rise to the level that would constitute Level A harassment (injurious take). Noise generated during cable landfall construction is of relatively short duration, low level, and in nearshore waters (which tend to be calmer than offshore) where PSO monitoring will be sufficient for detecting marine mammals to implement mitigation that effects the least practicable adverse impact on marine mammals. Similar to HRG surveys, given that the effects to marine mammals from cable landfall construction are expected to be limited to low level behavioral harassment (Level B harassment) even in the absence of mitigation (*i.e.,* no Level A harassment is expected or authorized), the limited additional benefit anticipated by adding this detection method for the short term cable landfall pile driving is not warranted or necessary to ensure the least practicable adverse impact on the affected species or stocks and their habitat.

Regarding the use of passive acoustic monitoring to implement the clearance and shutdown zones during foundation installation, as described in the proposed rule, NMFS is requiring the use of PAM to monitor 10 km zones around the piles and that the systems be capable of detecting marine mammals during pile driving within this zone. In this final rule, Tables 25 and 26 clearly specify this 10-km PAM monitoring zone. Dominion Energy is required to submit a PAM Plan to NMFS for approval at least 180 days prior to the planned foundation pile driving start date. NMFS will not approve a Plan where hydrophones used for PAM would be deployed from the pile driving vessel as this would result in hydrophones inside the bubble curtains, which would clearly be ineffective for monitoring; therefore, there is no need to explicitly state in this rule that this would not be allowed.

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 12: The Commission suggested that NMFS' proposed minimum visibility zone (2 km) during foundation pile driving is insufficient given that the Level A harassment zone for impact pile driving ranges from 3.2 to 5.7 km and that the Level B harassment zones range from 5.5 to 6.2 km for North Atlantic right whales.

Response: NMFS appreciates the suggestion by the Commission but does not agree that an increase of the minimum visibility zone is warranted. When modeling the PTS threshold zone sizes, Tetra Tech produced acoustic ranges ($R_{95\%}$). Acoustic ranges represent the distance to a harassment threshold based on sound propagation through the environment independent of any receiver. That is, the $R_{95\%}$ values represent the distance at which an animal would have to remain from a pile for the entire duration of exposure within a 24 hours period (in this case up to 2 monopiles per day or 2 pin piles per day). This assumption is unrealistic as we anticipate animals will move away from the source upon exposure as the area is primarily a North Atlantic right whale migration corridor and we do not anticipate whales to remain in the area for extended periods of time throughout the days. Further, the acoustic ranges are conservative in that they are calculated from 3D sound fields and then, at each horizontal sampling range, the maximum received level that occurs within the water column is used as the received level at that range. These maximum-over-depth (R_{max}) values are then compared to predetermined threshold levels to determine acoustic and exposure ranges to Level A harassment and Level B harassment zone isopleths. However, the ranges to a threshold typically differ among radii from a source, and also might not be continuous along a radii because sound levels may drop below threshold at some ranges and then exceed threshold at farther ranges. To minimize the influence of these inconsistencies, 5 percent of the farthest such footprints are typically excluded from the model data. The resulting range, $R_{95\%}$, is then chosen to identify the area over which marine mammals may be exposed above a given threshold, because, regardless of the shape of the maximum-over-depth footprint, the predicted range encompasses at least 95 percent of the horizontal area that would be exposed to sound at or above the specified threshold. $R_{95\%}$ excludes ends of protruding areas or small isolated acoustic foci not representative of the nominal ensonified zone. Finally, pile driving would occur during times when North Atlantic right whales are least likely to be in the Project Area. Creating a large minimum visibility distance despite the rarity of whales would unnecessarily delay the project such that work would be extended; thereby increasing the timeframe over which marine mammals may be exposed to construction activities.

For these reasons, NMFS does not believe it necessary to increase this zone size. Furthermore, even with the larger acoustic ranges produced from the conservative modeling, the minimum visibility zone does not differ greatly from those presented for other nearby projects which calculated distances to thresholds in consideration of animal movement (off of New Jersey, final Ocean Wind 1–1.65 km in the summer and 2.5 km in the winter; proposed Atlantic Shores South—1.9 km).

Comment 13: A commenter questioned why there was a depth restriction in Dominion Energy's Protected Species Mitigation and Monitoring Plan (PSMMP) when vessel speeds apply and recommended additional vessel restrictions regarding 10 kn or less within specific areas to reduce the risk of vessel strike on cetaceans.

Response: NMFS did not restrict any of the vessel speed measures to apply at specific depths; instead the measures are designed to apply to any and all vessel usage by Dominion Energy. Dominion Energy's project vessels would be restricted to 10 kn or less in certain circumstances, which include and in cases, go beyond existing vessel speed regulations. NMFS has included several measures in both the proposed and final rules that are sufficient to reasonably avoid vessel strike (see response to Comment 9 above for additional information). NMFS disagrees with the commenter that additional measures are necessary to avoid vessel strike.

Comment 14: A commenter suggested the NMFS should require Dominion to deploy additional noise attenuation technologies that, together with the double bubble curtain, reach a 15-

decibel (dB) reduction or greater in sound exposure level (''SEL'').

Response: NMFS acknowledges that underwater noise levels should be reduced to the greatest degree practicable to reduce impacts on marine mammals. As described in both the proposed and final rules, NMFS has included requirements for sound noise attenuation methods that successfully reduce foundation installation noise levels to, at a minimum, the levels modeled assuming 10-dB reduction. While NMFS is requiring that Dominion Energy reduce sound levels to equal or be below the model outputs analyzed (assuming a reduction of 10 dB), we are not assuming greater reduction as it is currently unclear (based on measurements to date) whether greater reductions are consistently practicable for these activities, even if multiple NAS systems are used. Preliminary sound measurements from South Fork Wind indicate that with multiple NAS systems, measured sound levels during impact driving foundation piles using a 4,000-kJ hammer are at or below those modeled assuming a 10-dB reduction and suggest, in fact, that two systems may sometimes be necessary to reach the targeted 10-dB reductions. In response to the recommendation by the commenters for NMFS to confirm that a 10-dB reduction is achieved, NMFS clarifies that, because no unattenuated piles would be driven, there is no way to confirm a 10-dB reduction; rather, *in-situ* SFV measurements will be required to confirm that sound levels are at or below those modeled assuming a 10-dB reduction. To further clarify, Dominion Energy must achieve an activity's modeled sound reduction during foundation installation. If the modeled sound reduction is not achieved, additional measures are required to reduce those noise levels.

Comment 15: A commenter expresses concern that NMFS' enhanced measures for North Atlantic right whales are not broadly applied to other ESA-listed large whale species. They also expressed concern over the Potential Biological Removal (PBR) for each stock not being assessed cumulatively based on the take authorized for CVOW–C and other threats to large whales.

Response: The commenter inappropriately conflates Level A harassment (*e.g.,* auditory injury, PTS) and Level B harassment (*i.e.,* behavioral disturbance) with mortality and serious injury through their reference to PBR levels. A stock's PBR level is ''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.'' PBR is not an appropriate metric to evaluate the take allowed under the CVOW regulations in the manner suggested by the commenter, which is take by Level A harassment or Level B harassment, not mortality or serious injury (*i.e.,* removals from the population). NMFS has described and used an analytical framework that is appropriate. We consider levels of ongoing anthropogenic mortality from other sources, such as commercial fisheries, in relation to calculated PBR levels as part of the environmental baseline in our negligible impact analysis.

Regarding cumulative impacts, NMFS refers the commenter to the response found in Comment 28 as the same information applies here. Furthermore, while the commenter is correct that enhanced mitigation and monitoring measures are required for North Atlantic right whales specifically, given their unique and precarious position, and that some of these measures will have beneficial effects on other species as well. For example, while PAM detections of a North Atlantic right whale, at any distance, would necessitate a shutdown/delay to any specified activity, we expect that other low-frequency specialists will benefit from the use of PAM (*i.e.,* detections) as these will provide additional awareness to complement PSOs on visual observation. While we do acknowledge that the ''at any distance'' provision is not a blanket requirement across all species, we believe that the additional awareness provided by PAM, in addition to the conservative zone sizes will also reduce negative impacts to these other species. Requiring shutdowns/delays ''at any distance'' for all large whale species, regardless of status, could potentially extend the duration project activities would be necessary, as more frequent shutdowns/delays would otherwise be needed. There are offsetting benefits to completing the project activities (specifically foundation installation) in a shorter amount of time, as extending these construction periods due to more frequent shutdowns runs the risk of extending activities into months where species densities are higher in the Project Area.

Comment 16: A commenter recommended that NMFS work more to encourage the use of gravity-based and suction bucket foundations rather than piled foundations, as these foundations have demonstrated a potential for reduced impacts to marine mammals while providing potentially more flexibility to developers. They further suggested that, if this isn't possible for CVOW–C or other future projects, which NMFS works with BOEM to encourage measures that could lead to greater levels of noise reduction during pile driving.

Response: NMFS agrees that there are sound minimization benefits to marine mammals when using non-pile driven foundations, such as the results shown in recent publications (*e.g.,* Potlock *et al.,* 2023). However, it is not within NMFS' authority to determine the applicant's specified activities. NMFS is required to authorize the requested incidental take if it finds such incidental take of small numbers of marine mammals by the requestor while engaging in the specified activities within the specified geographic region will have a negligible impact on such species or stock and, where relevant, will not have an unmitigable adverse impact on the availability of such species or stock for subsistence uses. As described in this notice of final rulemaking, NMFS finds that small numbers of marine mammals may be taken relative to the population size of the affected species or stocks and that the incidental take of marine mammals from all of the specified activities combined will have a negligible impact on all affected marine mammal species or stocks.

NMFS continually supports efforts to reduce ocean noise across various industries, including OSW. For example, NOAA's Ocean Noise Strategy (*https://oceannoise.noaa.gov/*) articulates the agency's vision for addressing ocean noise impacts to marine species, and NMFS supports BOEM's Recommendations for Offshore Wind Project Pile Driving Sound Exposure Modeling and Sound Field Measurement document and BOEM's Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans (*https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/FINAL%20Nationwide%20Recommendations%20for%20Impact%20Pile%20Driving%20Sound%20Exposure%20Modeling%20and%20Sound%20Field%20Measurement%20%28Acoustic%20Modeling%20Guidance%29.pdf*). NMFS and BOEM also are jointly working on the North Atlantic Right Whale and Offshore Wind Strategy (*https://www.noaa.gov/news-release/noaa-and-boem-announce-draft-offshore-wind-north-atlantic-right-whale-strategy*). All of these documents encourage reducing ocean noise,

including BOEM's establishment of quieting performance standards for OSW and conducting some level of SFVs on every pile installed, which NMFS has provided feedback on and supports. Finally, NMFS is collaborating with BOEM and the Department of Energy (DOE) on a recent funding notice focused on installation noise reduction and reliable moorings for offshore wind and marine energy (found here at: *https://www.energy.gov/eere/wind/articles/funding-notice-installation-noise-reduction-and-reliable-moorings-offshore-wind?utm_medium=email&utm_source=govdelivery*).

Comment 17: The commenters recommend that NMFS prohibit site assessment and site characterization activities during times of highest risk to North Atlantic right whales, using the best available science to define high-risk timeframes. In addition, the commenters suggest that NMFS should develop a real-time mitigation and monitoring protocol to dynamically manage the timing of site assessment and characterization activities to ensure those activities are undertaken during times of lowest risk for all relevant large whale species.

Response: As discussed in Comment 9, given the required vessel strike avoidance mitigation measures and small Level A harassment and Level B harassment isopleths for HRG surveys (54.2 m and 100 m, respectively), no Level A harassment, serious injury, or mortality is anticipated or authorized for this activity for any species, and the comparatively limited number of authorized takes by Level B harassment is expected to result in low-level impacts. The largest modeled Level B harassment zone size for the GeoMarine Dual 400 sparker (100 m) is already much smaller than the required separation and shutdown distances for North Atlantic right whale (500 m) and any unidentified large whale that would be treated as if it were a North Atlantic right whale. Furthermore, the proposed rule and this final rule include a framework of mitigation and monitoring measures designed to effect the least practicable adverse impact on marine mammals (see 50 CFR 217.294(e), 217.295). Therefore, NMFS disagrees there is a need to prohibit such surveys during ''high-risk timeframes'' and develop a dynamic management system.

Comment 18: One commenter recommended that all vessels responsible for crew transport (*i.e.,* service operating vessels) should use automated thermal detection systems to assist monitoring efforts while vessels are in transit.

Response: NMFS is requiring that all vessels, when transiting, must utilize trained, dedicated observers and, in the case of reduced visibility, use alternate technology to maintain visual monitoring, which may include infrared technologies (a type of thermal detection system). Dominion Energy is required to submit a Vessel Strike Avoidance Plan which will describe the type of technologies they propose to use to monitor for marine mammals. NMFS will evaluate that plan and determine if different or additional technology is required.

Comment 19: The commenter asserted that to minimize the impacts of underwater noise from HRG surveys to the fullest extent feasible, project proponents should select and operate sub-bottom profiling systems at power settings that achieve the lowest practicable source level for the objective.

Response: NMFS agrees with the suggestion made by the commenters that underwater noise levels should be reduced to the greatest degree practicable to reduce impacts on marine mammals. NMFS also agrees with the suggestion that Dominion Energy should utilize its HRG acoustic sources at the lowest practicable source level to meet the survey objective and has incorporated this requirement into the final rule (see § 217.294(e)(4)).

Comment 20: A commenter suggested that NMFS require: (1) at least 15 dB of sound attenuation from pile driving, with a minimum of 10 dB to be required; (2) field measurements be conducted on the first pile installed and the data must be collected from a random sample of piles through the construction period, although the commenter specifically notes that they do not support field testing of unmitigated piles; and (3) that all sound source validation reports of field measurements be evaluated by both NMFS and BOEM prior to additional piles being installed and that these reports be made publicly available. Another commenter has suggested that NMFS strengthen its requirement to maximize the level of noise reduction possible for the CVOW–C Project, utilizing 10 dB as the minimum only but meeting upwards of 20 dB of noise reduction. To support their assertion, they cited datasets by Bellmann *et al.* (2020 and 2022). They also recommended that NMFS require the ''best commercially available combined NAS technology'' to achieve noise reduction and attenuation.

Response: NMFS acknowledges that previous measurements (see Bellmann, 2019; Bellmann *et al.,* 2020) indicate that the deployment of double big bubble curtains should result in noise reductions beyond the assumed 10 dB. However, when sound field verifications (SFV) measurements are conducted during construction, several factors come into play in determining how well modeled levels/isopleths correspond to those measured in the field, such as the level at the source, how well the noise travels in the environment, and the effectiveness of the deployed NAS across a broad range of frequencies. For these reasons, NMFS conservatively assumes only a 10-dB noise reduction. Furthermore, if SFV measurements consistently demonstrate that distances to harassment thresholds are less than those modeled assuming 10 dB attenuation, adjustments in monitoring and mitigation can be made by NMFS, upon request by Dominion Energy. We reiterate that there is no requirement to achieve 10-dB attenuation as no unattenuated piles would be driven; therefore, it is not possible to collect the data necessary to enforce this requirement. However, as described in Comments 10 and 14, we are requiring the developer to meet the noise levels modeled, assuming 10-dB attenuation. NMFS is also actively engaged with other agencies and offshore wind developers on furthering quieting technologies.

It is important to note that the assumed 10-dB reduction is not a limit, it is a conservative estimate of the likely achievable noise reduction, which along with all other modeling assumptions, allows for estimation of marine mammal impacts and informs monitoring and mitigation. However, we have incorporated requirements to add or modify NAS in the event that noise levels exceed those modeled.

NMFS notes that Dominion Energy must conduct SFV on three monopiles and on all OSS foundations (n=12 pin piles total) and, at this time, NMFS does not support unmitigated field testing for pile installation. If SFV acoustic measurements indicate that ranges to isopleths corresponding to the Level A harassment and Level B harassment thresholds are less than the ranges predicted by modeling (assuming 10 dB attenuation), Dominion Energy may request a modification of the clearance and shutdown zones for foundation pile driving of monopiles. If requested and upon receipt of an interim SFV report, NMFS may adjust zones (*i.e.,* Level A harassment, Level B harassment, clearance, shutdown, and/or minimum visibility zone) to reflect SFV measurements. As part of the updates to the final rule, NMFS also requires maintenance checks and testing of NAS

systems before each use to ensure the NAS is usable and the system is able to achieve the modeled reduction, this information would be required to be reported to NMFS within 72 hours of an installation but before the next installation occurs.

Lastly, NMFS agrees that SFV reports (sound source validation reports) to NMFS should be required and evaluated by the agencies prior to further work commencing. NMFS agrees that the final SFV reports that have undergone quality assurance/quality control (QA/QC) by the agencies and include all of the required information to support full understanding of the results will be made publicly available; however, interim results without full review and all of the other supporting information are not ripe or appropriate for public availability.

Comment 21: A commenter stated that the seasonal restriction put into place for foundation pile driving for North Atlantic right whales should be assessed with regards to other marine mammal species, such as humpback whales, which may be present in higher numbers in the summer. They further suggested that additional protective approaches are needed for other species that may be present, such as the use of a real-time monitoring and mitigation system. Other commenters suggested dynamic management of activity temporal restrictions during project construction based on near real-time monitoring.

Response: NMFS acknowledges that the seasonal restriction for impact pile driving is to effect the least practicable adverse impact on North Atlantic right whales; however, NMFS notes that this seasonal restriction provides additional protections to large whale species that occur off of Virginia during summer months. For example, humpback whales, based on the Duke University density models (Roberts *et al.,* 2023), have higher occurrences in the late winter/early spring period (January through April) and reach their highest numbers within May and/or June. Subsequent declines in densities are noted after peak summer. Fin whales demonstrate a fairly year-round presence off of Virginia, with the highest densities occurring from November through May. We note that the highest densities are located in more offshore waters than the CVOW–C Project would be located and generally more northern in distribution. Harbor porpoises are primarily located off of Virginia from November through April, per Roberts *et al.* (2023). These durations almost all fall within the large seasonal restriction required by NMFS (November through April), which would reduce much of the impact to animals transiting through the area. Furthermore, Dominion Energy's analysis and take numbers were run assuming average seasonal densities, which may be slightly higher given increased densities when averaged with lower ones. Given that we expect marine mammals to actively be transiting through the area, rather than residing, impacts should be further lessened. While we acknowledge that some whales, such as the North Atlantic right whale, are acoustically detected year-round off of Virginia (Salisbury *et al.,* 2015), no scientific information or data supports the offshore Virginia waters as a Biologically Important Area for any other protected marine mammal species (besides the North Atlantic right whale migratory corridor). However, this is not to say that these species do not occur in these waters, but simply that the Virginia offshore waters are not primary habitat for essential life functions, such as foraging or calving, for other protected species. Instead, marine mammals primarily utilize these waters to transit to or from a more viable/important habitat.

Lastly, NMFS agrees that a near real-time monitoring system and protocols for North Atlantic right whales and other large whale species is a prudent and practicable measure and, as such, included real-time PSO monitoring and near real-time PAM (where practicable and effective (*i.e.,* foundation pile driving) in the proposed rule and the final rule (see Comments 21 and 22). Monitoring will inform whether other mitigation measures, such as delaying or shutting down a source, are triggered.

Monitoring, Reporting, and Adaptive Management

Comment 22: Commenters recommended that NMFS require real-time notifications of project activities (*e.g.,* HRG surveys, pile driving, *etc.*) and immediate notifications of any strandings or sightings of North Atlantic right whales or other protected species. Commenters also recommended NMFS make reports publicly available.

Response: The commenter did not identify why real-time notification to NMFS regarding project activities is necessary and NMFS does not agree this is necessary or practicable. Dominion Energy is required to submit weekly reports to NMFS during foundation installation, which includes project activities. It is not necessary for NMFS to track, in real-time, project activities.

NMFS agrees with the commenter that North Atlantic right whale reporting should be done in a timely manner. The proposed and final rule each contain situational reporting requirements for every North Atlantic right whale sighting or acoustic detection immediately but also recognizes the potential for immediate communication to be challenging. In both of the proposed and final rules, NMFS has included a requirement that if a North Atlantic right whale is observed at any time by PSOs or project personnel, Dominion Energy must ensure the sighting is immediately (if not feasible, as soon as possible and no longer than 24 hours after the sighting) reported to NMFS, the U.S. Coast Guard, and the Right Whale Sightings Advisory System (RWSAS). This includes stranded animals. If the North Atlantic right whale is stranded, the report (via phone or email) must include contact (name, phone number, *etc.*), the time, date, and location 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. Any acoustic detection of a North Atlantic right whale would be reported to NMFS as soon as possible, but no longer than 24 hours after the detection via the 24-hour North Atlantic right whale Detection Template (*https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates*).

PSOs and PAM operators are required to follow strict reporting requirements (*i.e.,* weekly and monthly (during foundation installation), and annually and situationally (all activities)) to document the sighting, behavior, species, *etc.* NMFS does not consider real-time reporting necessary, nor have we required it. ''Real-time'' reporting constitutes immediate or instantaneous notifications at the time of the sighting or observation. Instead, NMFS does, in the Monitoring and Reporting section, require ''near real-time'', which allows the notification to happen in a timely manner but after a reasonable delay when on the water. Weekly and monthly reports would be required for the duration of foundation installation. The final rule requires annual reports on sightings, activities, and take resulting from the project, and a 5-year report on all visual and acoustic monitoring. Situational reporting is required for any event that might need more direct NMFS-intervention (such as an adaptive

management need), due to the sighting of a large whale species, or an unexpected marine mammal interaction occurred or was detected. We also note that the commenter does not provide justification regarding what actions NMFS would be expected to undertake for real-time reporting, or why that would be necessary. In the event of sighting a dead or injured marine mammal, NMFS has included specific situational reporting requirements that would need to be undertaken as soon as feasible but within 24 hours. This feasibility requirement is necessary as there are many different situations that could occur on the water that could reduce communication potential, so NMFS allows the developer some time to maintain or recover communication if necessary. Because of this, NMFS does not see any issues with its requirements for situational reporting and feasibility and has opted not to change anything herein. The only circumstance wherein immediate reporting is required is in the unforeseen instance that a Project vessel strikes a marine mammal. The non-auditory injury or death of a marine mammal caused by vessel strike must be immediately reported to NMFS, and Dominion Energy must immediately cease all on-water activities until the NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. All final reports submitted to NMFS will be included on the website for availability to the public.

Comment 23: The commenter expressed concern regarding the PAM details and protocol as there is some variation on the ''target'' frequencies detectable based on the type of equipment chosen. The commenter stated that because of this ambiguity, ''it is not possible to assess what the detection capabilities will be based on the information.''

The commenter suggested that the use of a PAM system with localization capabilities, if available, should provide sufficient information regarding presence within the clearance/shutdown zone, but also recommended the use of other technologies (*e.g.,* semi-automated infrared systems, drones) to aid in marine mammal observation.

Response: As described in the proposed rule (88 FR 28656, May 4, 2023), Dominion Energy is required to submit a detailed PAM Plan to NMFS for approval that describes the PAM system(s) proposed for use. While the systems are not yet finalized (hence the variability noted by the commenter), NMFS has established criteria in the proposed and final rules (*e.g.,* the system must be capable of detecting baleen whales out to 10 km from the pile being installed). NMFS will evaluate if the bandwidth capabilities of the PAM system proposed meet these criteria. Furthermore, our Adaptive Management provision within the final rule allows us to adapt to new technology and information, which allows us, in discussions with Dominion Energy, to modify the PAM monitoring, as determined to be applicable.

NMFS disagrees that PAM alone should be used to monitor marine mammals and is requiring both visual and acoustic monitoring for specific specified activities. As described in the proposed rule, NMFS requires that Dominion Energy employ both visual and PAM methods as both approaches aid and complement each other (Van Parijs *et al.,* 2021). NMFS has also considered the use of semi-automated infrared systems to support visual monitoring. While Dominion Energy is free to propose using such systems, we are not requiring Dominion Energy to use such systems at this time (see Comment 23). Similar to the PAM Plan, NMFS requires Dominion Energy to submit, for approval, a Pile Driving Monitoring Plan that meets the criteria required in this final rule (*e.g.,* visually observe for marine mammals to select distances). Similar to PAM, the Adaptive Management provision in the final rule allows for technological developments in monitoring or mitigation to be implemented, in coordination with Dominion Energy.

Comment 24: Commenter suggested that NMFS require tracking and monitoring for ''unusual patterns'' in protected species strandings specifically related to HRG surveys and other construction activities.

Response: As NMFS has explained in the proposed rule and in this final rule, strandings (*e.g.,* mortality) are not an anticipated outcome of the specified activities, including HRG surveys, and there is no evidence to suggest otherwise. Further, marine mammal strandings are fully tracked and monitored via NMFS' Marine Mammal Health and Stranding Response Program (*https://www.fisheries.noaa.gov/national/marine-life-distress/marine-mammal-health-and-stranding-response-program*). As such, NMFS disagrees that Dominion Energy should be required to track strandings.

Comment 25: A commenter requested NMFS define the frequency at which we would review any new information for modifications to the LOA via the Adaptive Management provision. A commenter recommended this occur once a quarter, while allowing for a mechanism to undertake review and adaptive management on an *ad hoc* basis if a serious issue is identified (*e.g.,* if unauthorized takes by Level A harassment are reported or if serious injury or mortality occurs). They have also recommended that NMFS incorporate review by independent subject-matter experts to increase transparency, to provide an opportunity to share information, and to allow for the input of additional scientific expertise.

Response: We disagree that the frequency at which information is reviewed should be defined in the Adaptive Management provision. The purpose of the Adaptive Management is to allow for the incorporation of new information as it becomes available, which could mean advancements and new information becomes available quickly (*i.e.,* days or weeks) that would necessitate NMFS to consider adapting the issued LOA, or over long periods of time as robust and conclusive information becomes available (*i.e.,* months or years). NMFS will be reviewing interim reports as they are submitted; hence, the quarterly review, as suggested by the commenter, is not necessary. NMFS retains the ability to make decisions as information becomes available, and after discussions with Dominion Energy about feasibility and practicability.

Regarding the suggestion for *ad hoc* changes in the event that additional take by Level A harassment or take via serious injury/mortality of a marine mammal occurs, we do not agree with the suggestion by the commenter. NMFS has included two relevant provisions in its final rule that state that ''[t]ake by mortality or serious injury of any marine mammal species is not authorized'' and that ''it is unlawful for any person to . . . take any marine mammal specified in the LOA in any manner other than as specified in the LOA.'' We refer the commenter to the ''Prohibitions'' portion of the regulatory text (see § 217.293). In the event Dominion Energy's project takes any marine mammals in a manner that has not been authorized in the final rule (see § 217.293) these would be in violation of the MMPA and regulations and NMFS would undertake appropriate actions, as determined to be necessary (*see* 16 U.S.C. 1371(a)(5)(B)).

Lastly, regarding independent review, NMFS disagrees that such reviews should be incorporated into the adaptive management process. The MMPA and its implementing regulations require that incidental take

regulations be established based on the best available information and the MMPA does not proscribe use of independent, subject matter expert review of NMFS' determinations outside of the public comment process.

Comment 26: Commenters stated that the regulations must include a requirement for all phases of the CVOW–C 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 North Atlantic right whales and any dead, injured, or entangled marine mammals to NMFS or the U.S. Coast Guard as soon as possible and no later than the end of the PSO shift. A commenter stated that to foster stakeholder relationships and allow public engagement and oversight of the permitting, the ITA should require all reports and data to be accessible on a publicly available website. Another commenter also suggested that all quarterly reports of PSO sightings must be made publicly available to continue to inform marine mammal science and protection.

Response: NMFS notes the commenters' recommendations to report all visual and acoustic detections of North Atlantic right whales and any dead, injured, or entangled marine mammals to NMFS are consistent with the proposed rule and this final rule (see Situational Reporting). We refer the reader to § 217.295(g)(13), (15)(i)–(v) of the regulations for more information on situational reporting. NMFS requires North Atlantic right whale sightings to be reported immediately (if not feasible, as soon as possible and no longer than 24 hours after the sighting). Similarly, if a North Atlantic right whale is acoustically detected at any time by a project-related PAM system, Dominion Energy must report the detection as soon as possible to NMFS, but no longer than 24 hours after the detection. Daily visual and acoustic detections of North Atlantic right whales and other large whale species along the Eastern Seaboard, as well as Slow Zone locations, are publicly available on WhaleMap (*https://whalemap.org/whalemap.html*). Further, recent acoustic detections of North Atlantic right whales and other large whale species are available to the public on NOAA's Passive Acoustic Cetacean Map website (*https://www.fisheries.noaa.gov/resource/data/passive-acoustic-cetacean-map*). Given the open access to the resources described above, NMFS does not concur that public access to quarterly PSO reports is warranted and we have not included this measure in the authorization. However, NMFS will post all final reports to our website. We refer the commenters to § 217.295(g) for more information on reporting requirements in the regulations.

Effects Assessment

Comment 27: Commenters stated that NMFS must use the more recent and best available science, including population estimates, in evaluating impacts to North Atlantic right whales, given its critically endangered status. This includes using updated population estimates, recent habitat usage patterns for the project area, and a revised discussion of the acute, chronic, and cumulative stress on North Atlantic right whales in the region.

Response: NMFS has used the best available science in its analysis. Since issuance of the proposed rule, NMFS has finalized the 2022 Stock Assessment Report (SAR) indicating the North Atlantic right whale population abundance is estimated as 338 individuals (confidence interval: 325–350; 88 FR 4162, January 24, 2023). NMFS has used this most recent best available information in the analysis of this final rule. This new estimate, which is based off the analysis from Pace *et al.* (2017) and subsequent refinements found in Pace (2021), is included by reference in the draft and final 2022 Stock Assessment Reports (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment reports*) and provides the most recent and best available estimate, including improvements to NMFS' right whale abundance model. More recently, in October 2023, NMFS released a technical report identifying that the North Atlantic right whale population size based on sighting history through 2022 was 356 whales, with a 95 percent credible interval ranging from 346 to 363 (Linden, 2023). NMFS conservatively relies on the lower SAR abundance estimate in this final rule. The finalization of the draft to final 2022 SAR did not change the estimated take of North Atlantic right whales or authorized take numbers, nor affect our ability to make the required findings under the MMPA for Dominion Energy's construction activities.

NMFS cannot require applicants to utilize specific models for the purposes of estimating take incidental to offshore wind construction activities, but we do require use of the Roberts *et al.* (2016, 2023) density data for all species, which represents the best available science regarding marine mammal occurrence.

The proposed rule includes discussion of North Atlantic right whale habitat use in the Project Area, which is located off of Virginia (NMFS notes the comments provided incorrectly reference southern New England). The proposed rule also includes a discussion of the effects of stress on marine mammals from exposure to noise from the project; the discussion is informed by the best available science. NMFS has carefully reviewed the best available scientific information in assessing impacts to marine mammals and recognizes that Dominion Energy's activities have the potential to impact marine mammals through behavioral effects, stress responses, and temporary auditory masking. However, and specifically given the predicted exposures and number of authorized takes, NMFS does not expect that the generally short-term, intermittent, and transitory marine site characterization survey activities planned by Dominion Energy will create conditions of acute or chronic acoustic exposure leading to long-term physiological stress responses in marine mammals. For pile driving activities, and also specifically given the predicted exposures and amount of authorized take, we do not expect that the impacts from these activities would result in acute or chronic acoustic exposure that would lead to long-term physiological stress responses as these activities will all be localized and performed for limited durations. Additionally, for all activities, NMFS has prescribed a robust suite of mitigation and monitoring measures, including extended distance shutdowns for North Atlantic right whales, seasonal restrictions, dual-PSO and PAM usage, and NAS use 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 determinations presented in NMFS' negligible impact analyses. Furthermore, the area in which CVOW–C is located is not a known feeding habitat for North Atlantic right whales, although it is found within the migratory corridor BIA for North Atlantic right whales. NMFS does not anticipate that North Atlantic right whales would be displaced from the area where Dominion Energy's activities would occur, and the commenter does not provide evidence that this effect should be a reasonably anticipated outcome of the specified activity.

With respect to cumulative impacts, please see response to Comment 28.

Comment 28: Several commenters raised concerns regarding the cumulative impacts of the multiple offshore wind projects being developed

throughout the range of marine mammals, including North Atlantic right whales, and specifically recommended that NMFS carefully consider the discrete effects of each activity and the cumulative effects of the suite of approved, proposed, and potential activities on marine mammals to ensure that the cumulative effects are not ''excessive'' before the promulgation of the final rule.

Another member of the public expressed concerns over the number of North Atlantic right whales that have ''already been killed'' when combined with other offshore wind projects along the East Coast.

A member of the public has asked how NOAA is tracking the takes of several species, including marine mammals, and where this list can be found for the public. They have also asked how NOAA will determine an ''acceptable'' number of possible harassment/injuries/deaths for each species, annually, could occur.

Response: Neither the MMPA nor NMFS' codified implementing regulations call for consideration of the take resulting from other activities in the negligible impact analysis. The preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989) states, in response to comments, that the impacts from other past and ongoing anthropogenic activities are to be incorporated into the negligible impact analysis via their impacts on the baseline. Consistent with that direction, NMFS has factored into its negligible impact analysis the impacts of other past and ongoing anthropogenic activities via their impacts on the baseline (*e.g.,* as reflected in the density/distribution and status of the species, population size and growth rate, 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 ITR as well as other ITRs currently in effect or proposed within the specified geographic region, are appropriately considered an unrelated activity relative to the others. The ITRs are unrelated in the sense that they are discrete actions under section 101(a)(5)(A) issued to discrete applicants. Section 101(a)(5)(A) of the MMPA requires NMFS to make a determination that the take incidental to a ''specified activity'' will have a negligible impact on the affected species or stocks of marine mammals. NMFS' implementing regulations require applicants to include in their request a detailed description of the specified activity or class of activities that can be expected to result in incidental taking of marine mammals (*see* 50 CFR 216.104(a)(1)). Thus, the ''specified activity'' for which incidental take coverage is being sought under section 101(a)(5)(A) is generally defined and described by the applicant. Here, Dominion Energy was the applicant for the ITR, 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 (54 FR 40338, September 29, 1989), NMFS also indicated (1) that we would consider cumulative effects that are reasonably foreseeable when preparing a National Environmental Policy Act (NEPA) analysis and (2) that reasonably foreseeable cumulative effects would also be considered under section 7 of the ESA for listed species, as appropriate. Accordingly, NMFS has adopted an Environmental Impact Statement (EIS) written by BOEM and reviewed by NMFS as part of its inter-agency coordination. This EIS addresses cumulative impacts related to Dominion Energy and substantially similar activities in similar locations. Cumulative impacts regarding the promulgation of the regulations and issuance of a LOA for construction activities, such as those planned by Dominion Energy, have been adequately addressed under NEPA in the adopted EIS that supports NMFS' determination that this action has been appropriately analyzed under NEPA. Separately, the cumulative effects of Dominion Energy on ESA-listed species, including North Atlantic right whales, was analyzed under section 7 of the ESA when NMFS engaged in formal inter-agency consultation with the ESA Interagency Cooperation Division within the Office of Protected Resources. The Biological Opinion for CVOW–C determined that NMFS' promulgation of the rulemaking and issuance of a LOA for construction activities associated with leasing, individually and cumulatively, are likely to adversely affect, but not jeopardize, listed marine mammals.

Given that each project is considered its own discrete action, for final marine mammal sightings recorded during each relevant project, NMFS directs the public to the relevant Project web page, where annual and final reports will be published describing the number of marine mammals detected within specific harassment zones to date and across the entire effective period of the Project.

Regarding the number of North Atlantic right whales for which take has been authorized—NMFS reiterates that only Level B harassment (behavioral) is anticipated and has been authorized for this species. In looking at the maximum annual authorized number, Dominion Energy is authorized to harass no more than 7 North Atlantic right whales (assuming each instance of harassment occurs to a different individual), representing 2.04 percent of the total population. Over the course of 5 years, Dominion Energy would be authorized to harass up to 17 individual North Atlantic right whales. We expect that any instance of harassment would result in short-term impacts such as avoidance of the project area but not abandonment of their migratory habitat. Further, as described in the Negligible Impact Analysis and Determination Section, the location of the least area (44 km offshore) and seasonal restriction on foundation installation pile driving (the most impactful activity) provides high conservation benefit and greatly minimizes impacts on North Atlantic right whales (as evidenced by the very small amount of take authorized despite the size of the project). We reiterate that we do not anticipate, nor have we proposed or authorized, mortality or serious injury for any marine mammal species for the CVOW–C Project. This includes for North Atlantic right whales, where no Level A harassment is anticipated or authorized due to the mitigation measures required to be implemented by Dominion Energy.

Comment 29: Several commenters stated that more time and research is needed to understand what the impacts of offshore wind may be on the ocean and marine life.

Response: NMFS is required to authorize the requested incidental take if it finds the total incidental take of small numbers of marine mammals by U.S. citizens while engaging in a specified activity within a specified geographic region during a five-year period (or less) will have a negligible impact on such species or stock and where appropriate, will not have an unmitigable adverse impact on the availability of such species or stock for subsistence uses (16 U.S.C. 1371(a)(5)(A)). While the incidental take authorization must be based on the best scientific information available, the MMPA does not allow NMFS to delay issuance of the requested authorization on the presumption that new information will become available in the future. NMFS has made the required findings, based on the best scientific

information available and has included mitigation measures to effect the least practicable adverse impacts on marine mammals.

Other

Comment 30: Two commenters have encouraged NMFS to issue LOAs on an annual basis, rather than a single 5-year LOA, to allow for the continuous incorporation of the best available scientific and commercial information and to modify mitigation and monitoring measures as necessary and in a timely manner, as well as to account for the quickly evolving situation for the North Atlantic right whale.

Response: NMFS appreciates the commenter regarding our ITA process. While NMFS acknowledges the commenter's rationale, we do not think it is necessary to issue annual LOAs as: (1) the final rule includes requirements for annual reports (in addition to weekly and monthly requirements) to support annual evaluation of the activities and monitoring results, and (2) the final rule includes an Adaptive Management provision (see § 217.297(c)) that allows NMFS to make modifications to the mitigation, monitoring, and reporting measures found in the LOA if new information supports the modifications and doing so creates a reasonable likelihood of more effectively accomplishing the goals of the measures.

Comment 31: Several commenters have expressed concern regarding the recent whale deaths, which they claim are the result of offshore wind activities and pre-construction survey activities. Another commenter has suggested that NMFS should consider whether or not authorizing Level A harassment or Level B harassment should be permissible given the recent elevated public concern about potential impacts on marine mammals from offshore wind activities.

Another commenter has stated that NMFS cannot determine the cause of the recent whale deaths accurately without doing necropsies. Because of this, the commenter states that NMFS cannot determine that recent whale mortalities were not related to ''the whales' diminished ability to determine its location due to acoustic damage to its echolocation systems'' from offshore wind-related surveys (*i.e.,* HRG and site assessment surveys).

Lastly, another commenter stated that funding should be made available to: (1) train PSOs; (2) stranding network organizations to carry out necessary carcass recovery, examination, and diagnostic tests to exclude acoustic injuries as reasons for strandings associated with HRG surveys and/or construction activities; and (3) understand how strandings of protected species in unusual patterns during or around times where HRG surveys/construction activities occur so that costs can be calculated for the relevant response (*e.g.,* offshore whale carcass towing, heavy equipment rentals, *etc.*) as well as to provide accountability on the cause of the stranding.

Response: There is no evidence that noise resulting from offshore wind development-related site characterization surveys, which are conducted prior to construction, could potentially cause marine mammal strandings, and there is no evidence linking recent large whale mortalities and currently ongoing surveys. This point has been well supported by other agencies, including BOEM and the Marine Mammal Commission. The commenters offer no such evidence or other scientific information to substantiate their claim. NMFS will continue to gather data to help us determine the cause of death for these stranded whales.

The Marine Mammal Commission's recent statement supports NMFS' analysis: ''There continues to be no evidence to link these large whale strandings to offshore wind energy development, including no evidence to link them to sound emitted during wind development-related site characterization surveys, known as HRG surveys. Although HRG surveys have been occurring off New England and the mid-Atlantic coast, HRG devices have never been implicated or causatively associated with baleen whale strandings.'' (Marine Mammal Commission Newsletter, Spring 2023). There is an ongoing Unusual Mortality Event (UME) for humpback whales along the Atlantic coast from Maine to Florida, which includes animals stranded since 2016. Partial or full necropsy examinations were conducted on approximately half of the whales. Necropsies were not conducted on other carcasses because they were too decomposed, not brought to land, or stranded on protected lands (*e.g.,* national and state parks) with limited or no access. Of the whales examined (roughly 90), about 40 percent had evidence of human interaction, either ship strike or entanglement. Vessel strikes and entanglement in fishing gear are the greatest human threats to large whales. The remaining 50 necropsied whales either had an undetermined cause of death (due to a limited examination or decomposition of the carcass) or had other causes of death including parasite-caused organ damage and starvation. The best available science indicates that only Level B harassment, or disruption of behavioral patterns (*e.g.,* avoidance), may occur as a result of Dominion Energy's HRG surveys. NMFS emphasizes that there is no credible scientific evidence available suggesting that mortality and/or serious injury is a potential outcome of the planned survey activity.

Additionally, NMFS has not authorized mortality or serious injury in this final rule, and such taking is prohibited under § 217.292(c) of the regulations and may result in modification, suspension, or revocation of an LOA issued under these regulations. NMFS notes there has never been a report of any serious injuries or mortalities of a marine mammal associated with site characterization surveys.

Furthermore, while NMFS agrees in the value of necropsies in determining the cause of death of a stranded marine mammal, NMFS stranding partners cannot perform necropsies on every dead animal as some of the carcasses were either too decomposed, not brought to land, or stranded on protected lands (*e.g.,* national and state parks) with limited or no access. Furthermore, and as described on our website, large whale necropsies are very complicated, requiring many people and typically heavy equipment (*e.g.,* front loaders, *etc.*). Some whales are found dead floating offshore and need to be towed to land for an examination. There can be limitations for access and using heavy equipment depending on the location where the whale stranded, including protected lands (parks or concerns for other endangered species) and accessibility (remote areas, tides that prevent access at times of day). Also, necropsies are the most informative when the animal died relatively recently. Some whales are not found until they are already decomposed, which limits the amount of information that can be obtained. Finally, funding is limited, and varies by location and stranding network partner. For more information on offshore wind and whales, we reference the commenter to our website: *https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/frequent-questions-offshore-wind-and-whales.*

Additionally, a commenter raised a concern regarding potential injury to ''echolocation systems''. All large whales that have stranded since December 2011, with the exception of three sperm whales, have been mysticete (baleen) whales (*e.g.,* humpback whales, minke whales),

which do not have the ability to echolocate, a process by which toothed whales (*e.g.,* sperm whales) and dolphins emit high-frequency sounds from their melon to obtain information about objects (typically prey) in the water. Because baleen whales do not echolocate like toothed whales and dolphins, there is no concern over impeding such ability. Additionally, several species of delphinids and beaked whales have stranded off Virginia since 2011; however, there is no evidence that the acoustic sources used during HRG surveys contributed to these events.

Regarding available funding, as suggested by another commenter, Dominion Energy is responsible for acquiring NMFS-approved PSOs to conduct marine mammal monitoring as prescribed in its rule. PSOs working on the CVOW–C Project would not be involved in stranding response beyond the required reporting measures (*i.e.,* reporting sightings of dead or injured marine mammals to the Stranding Response Network. The Marine Mammal Health and Stranding Response Program (MMHSRP) coordinates emergency responses to sick, injured, distressed, or dead seals, sea lions, dolphins, porpoises, and whales. The MMHSRP works with volunteer stranding and entanglement networks as well as local, tribal, State, and Federal government agencies to coordinate and conduct emergency responses to stranded or entangled marine mammals. The Prescott Grant Program (*https://www.fisheries.noaa.gov/grant/john-h-prescott-marine-mammal-rescue-assistance-grant-program*) provides funding for members of the national marine mammal stranding network through a competitive grant process for (1) recovery and treatment (*i.e.,* rehabilitation) of stranded marine mammals; (2) data collection from living or dead stranded marine mammals; and (3) facility upgrades, operation costs, and staffing needs directly related to the recovery and treatment of stranded marine mammals and the collection of data from living or dead stranded marine mammals. From 2001 through 2023, the Program awarded more than $75.4 million in funding through 893 competitive grants to Stranding Network members in 26 states, the District of Columbia, two territories, and three tribes.

Comment 32: A commenter has stated that there is a data need for information related to vessel density as it relates to changes in vessel routing and traffic patterns. The commenter further stated that the acquisition of this information would be beneficial when compared to species distribution and habitat data. They also stated that this data would provide context to any observed changes in rates of vessel strikes, fishing gear, entanglements, and impacts on fisheries in terms of gear loss and protected species interactions. They also suggested that NMFS should require vessels to maintain a specific transit (east and northeast of the Lease Area) to avoid nearshore areas.

Response: NMFS provided information related to the amount and types of vessels to be used for CVOW–C and is requiring that that all of Dominion Energy's vessels must be equipped with properly installed and operational AIS devices and that Dominion Energy must report all Maritime Mobile Service Identify (MMSI) numbers to NMFS Office of Protected Resources. This will allow for an evaluation of Dominion Energy vessel traffic movement. NMFS is not requiring Dominion Energy vessels to maintain a specific transit (East and Northeast of the Lease Area) to avoid nearshore areas as Dominion Energy must use ports and some aspects of work are located in nearshore waters requiring vessel use in that area. Therefore, restricting Dominion Energy vessels waters outside of the nearshore area (which is undefined by the commenter) is not practicable.

Comment 33: A commenter insisted that NOAA Marine Mammal Health and Stranding Program staff be guaranteed site access for response to and rescue of stranded animals. The commenter also expressed a desire for clarification on the photographs that could be taken during a sighting of a stranding, and that specific parameters should be discussed for these photos to allow for the appropriate response to be taken.

Response: NMFS cannot require access be given in all cases for stranded animals, as sometimes the carcass never returns to shore or strands on protected lands, such as national or state parks, with limited access. Given these instances are situational and the appropriate actions are determined by trained specialists, we defer to their knowledge and expertise instead.

Regarding the comment on the photographs in the event of a stranding or dead animal, NMFS does not see a reason to require very specific parameters for these photographs, as all observations would be taken in the offshore environment where conditions are typically difficult. Additionally, we expect that few, if any, of the crew would be trained in proper necropsy technique to know which photographs to take or what to look for; instead, we ask the developer and their crew (alongside the NMFS-approved PSOs and PAM operators) to collect any evidence, information, and photographs they are capable of and have access to, instead of providing additional restrictions that may complicate the acquisition of important data. If a decision is made to retrieve or tow a carcass to shore, we expect that trained stranding specialists would be on hand to handle the specifics the commenter is referring to. Because of this, we do not see the need to require the suggestion by the commenter.

Comment 34: The commenter has stated that an oil spill contingency plan should be created in the event of an oil spill from CVOW–C.

Response: NMFS agrees with the commenter that this is an important consideration for the CVOW–C Project. We direct the commenter to BOEM, as an oil spill response plan was included in Appendix Q of the CVOW–C COP (*https://www.boem.gov/renewable-energy/state-activities/cvow-construction-and-operations-plan*) and within the final EIS developed for the project (*https://www.boem.gov/renewable-energy/state-activities/CVOW-C*). Given NMFS is not authorizing incidental take from oil spills, we do not analyze this directly in our MMPA ITA and this is not discussed further.

Comment 35: A commenter recommended that Dominion Energy test and deploy an all-weather, semi-, or fully-automated whale detection system in the mouth of the Chesapeake Bay to reduce the risk of vessel strike.

Response: NMFS does not agree with the commenter that Dominion Energy must deploy an all-weather, semi-, or fully-automated whale detection system in the mouth of the Chesapeake Bay to reduce the risk of vessel strike. The commenter did not provide a description of additional benefits this type of system would achieve compared to the dual-PAM and visual observation requirements NMFS proposed and requires for vessel transit. Furthermore, the Woods Hole Oceanographic Institution, in collaboration with the CMA CGM Group, have deployed an acoustic monitoring buoy approximately 33 miles (53.12 km) off Norfolk, Virginia (see the press release at: *https://www.whoi.edu/press-room/news-release/whoi-and-cma-cgm-group-deploy-acoustic-monitoring-buoy-near-norfolk-virginia/*). While not located in the mouth of the Bay, this buoy provides near real-time detection for North Atlantic right whale calls, that will be publicly displayed on a website called Roborts4Whales (*http://robots4whales.whoi.edu/*) and shared with mariners, including vessel captains. Based on the parameters suggested by the commenter along with the publicly available data from existing systems, we disagree with the commenter's recommendation.

Comment 36: The commenter has stated that nowhere in Dominion Energy's PSMMP does it describe a need for baseline information on species presence, distribution, and behavior. They further compound that while short-term impacts from surveys and construction activities are likely, long-term impacts from operation would be challenging to assess without baseline information. Because of this, the commenter has suggested that additional investments into gathering baseline information should occur, which would allow for increased monitoring during the construction and operation phases and that it should be mandated that baseline data is collected for all projects before approvals are given.

Response: NMFS notes to the commenter that this information would not be found in Dominion Energy's PSMMP, but information regarding species and baseline/known information is found in the ITA application itself (see NMFS' web page at *https://www.fisheries.noaa.gov/action/incidental-take-authorization-dominion-energy-virginia-construction-coastal-virginia*). NMFS also included some information about species that have established BIAs or known UMEs in the proposed rule (see 88 FR 28656, 28672), with updates included where applicable in the final rule. We additionally point the commenter to our website (*https://www.fisheries.noaa.gov/find-species*) and to the SARs (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) for more information.

The MMPA requires NMFS to evaluate the effects of the specified activities based on the best scientific evidence available and to issue the requested incidental take authorization if it makes the necessary findings. The MMPA does not allow NMFS to delay issuance of the requested authorization on the presumption that new information will become available in the future. If new information becomes available in the future, NMFS may modify the mitigation and monitoring measures in an LOA issued under these regulations through the adaptive management provisions. Furthermore, NMFS is required to withdraw or suspend an LOA if it determines that the authorized incidental take may be having more than a negligible impact on a species or stock. This determination is made following notice and opportunity for public comment, unless and emergency exists that poses a significant risk to the well-being of the marine mammal species or stock.

NMFS has duly considered the best scientific evidence available in its effects analysis. The *Potential Effects of Underwater Sound on Marine Mammals* section of the proposed rule included a broad overview of the potential impacts on marine mammals from anthropogenic noise and provided summaries of several studies regarding the impacts of noise from several different types of sources (*e.g.,* airguns, Navy sonar, vessels) on large whales, including North Atlantic right whales. Offshore wind farm construction generates noise that is similar, or, in the case of vessel noise, identical, to noise sources included in these studies (*e.g.,* impact pile driving and airguns both produce impulsive, broadband sounds where the majority of energy is concentrated in low frequency ranges), and the breadth of the data from these studies helps us predict the impacts from wind activities. In addition, as described in the proposed rule, it is general scientific consensus that behavioral responses to sound are highly variable and context-specific and are impacted by multiple factors including, but not limited to, behavioral state, proximity to the source, and the nature and novelty of the sound. Overall, the ecological assessments from offshore wind farm development in Europe and peer-reviewed literature on the impacts of noise on marine mammals both in the U.S. and worldwide provides the information necessary to conduct an adequate analysis of the impacts of offshore wind construction and operation on marine mammals in the Atlantic Outer Continental Shelf. NMFS acknowledges that studies in Europe typically focus on smaller porpoise and pinniped species, as those are more prevalent in the North Sea and other areas where offshore wind farms have been constructed. The commenter did not provide additional scientific information for NMFS to consider.

Comment 37: A commenter asserts that the ITR and LOA process lacks transparency and 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.*). They requested NMFS improve the transparency of this process and move away from a ''segmented phase-by-phase and project-by-project approach'' for authorization. In addition, they requested NMFS provide a comprehensive list/table of all takes by Level A harassment and Level B harassment under currently approved and requested authorizations per project.

Response: The MMPA, and its implementing regulations allow, 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 authorizes the requested incidental take of marine mammals if it finds 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 refers the public to its website for more information on the marine mammal incidental take authorization process and timelines (*https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*).

NMFS emphasizes that an IHA or rulemaking/LOA 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 Dominion Energy's request to incidentally take marine mammals in the course of constructing the CVOW–C Project. The authorization of the specified activities is not within NMFS' jurisdiction; instead, this falls under BOEM's

purview and NMFS refers the public to BOEM's website: *https://www.boem.gov/renewable-energy.* Additionally, for the commenter's awareness, NMFS maintains a list of all proposed and issued authorizations for renewable energy activities, including the requested, proposed, and/or authorized take is available on the agency website at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.*

Lastly, regarding the commenter's concern about assessing all offshore wind projects cumulatively, NMFS will not repeat the response but instead refers the commenter to Comment 28, where we explain why each project is considered discrete and as its own separate action.

Comment 38: A commenter stated that the presence of wind turbines will impact NMFS' ability to conduct low-altitude (1,000 m) marine mammal assessment aerial surveys, thus impacting NMFS' ability to continue using current methods to fulfill its mission of precisely and accurately assessing and managing protected species.

Response: NMFS and BOEM have collaborated to establish the Federal Survey Mitigation Strategy for the Northeast U.S. Region (Hare *et al.,* 2022). This interagency effort is intended to guide the development and implementation of a program to mitigate impacts of wind energy development on fisheries surveys. For more information on this effort, please see *https://repository.library.noaa.gov/view/noaa/47925.*

Comment 39: Expressing concerns regarding enforcement, commenters expressed interest in understanding the outcome if the number of actual takes exceeds the number authorized during construction of an offshore wind project (*i.e.,* if the project would 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.

Another member of the public recommended that if a marine mammal is killed during the specified construction activities for CVOW–C, then Dominion Energy should ''be fined a considerable sum.''

Response: NMFS carefully reviews models and take estimate methodology to authorize a number of takes, by species and manner of take, which is a likely outcome of the project. There are several conservative assumptions built into the models to ensure the number of takes authorized is sufficient based on the description of the project. Dominion Energy would be required to submit frequent reports which would identify the number of takes applied to the project.

In the unexpected event that Dominion Energy exceeds the number of takes authorized for a given species, the MMPA and its implementing regulations state that NMFS shall withdraw or suspend the LOA issued under these regulations, after notice and opportunity for public comment, if it finds the methods of taking or the mitigation, monitoring, or reporting measures are not being substantially complied with, or the taking allowed is having, or may have, more than a negligible impact on the species or stock concerned (16 U.S.C. 1371(a)(5)(B); 50 CFR 216.206(e)). Additionally, failure to comply with the requirements of the LOA may result in civil monetary penalties and knowing violations may result in criminal penalties (16 U.S.C. 1375; 50 CFR 216.206(g)).

Moreover, as noted previously, fishing impacts (and NMFS' assessment of them) generally center on entanglement in fishing gear, which is a very acute, visible, and severe impact (mortality or serious injury). In contrast, the impacts incidental to the specified activities are primarily acoustic in nature and limited to Level A harassment and Level B harassment, there is no anticipated or authorized serious injury or mortality that the fishing industry could theoretically be held accountable for. Any take resulting from the specified activities would not be associated with take authorizations related to commercial fish stocks. The impacts of commercial fisheries on marine mammals and incidental take for said fishing activities are managed separately from those of non-commercial fishing activities such as offshore wind site characterization surveys, under MMPA section 118.

Comment 40: A commenter suggested that NMFS require Dominion Energy to utilize direct-drive turbines instead of gearboxes.

Response: Dominion Energy has indicated they intend to use direct drive turbines for the CVOW–C Project, based on Section 3.3.1.1 of their COP, specifically the Siemens Gamesa SG 14–222 DD WTG model (see *https://www.boem.gov/renewable-energy/state-activities/cvow-construction-and-operations-plan*). Furthermore, as already described above in Comment 37, the applicant is the one to determine the project (*i.e.,* the Proposed Action), not NMFS.

Comment 41: A commenter suggested various mitigation and monitoring measures in the event that gravity-based and/or suction-bucket foundations are used instead of impact/vibratory-driven foundations (*i.e.,* clearance and shutdown zones at distances that they assert would eliminate all take by Level A harassment of North Atlantic right whales and other large whales; visual and acoustic monitoring for large whales; shutdown for large whale visual observations or acoustic detections; restart of construction after shutdown; use of near-real time PAM for vessel(s); alternative monitoring technologies for monitoring (infrared drones, hydrophones); mandatory vessel speed restrictions; and required reporting).

Response: NMFS appreciates the suggestions by the commenter and refers to Comment 16 above where we discuss gravity-based and other foundation types for the CVOW–C Project. However, Dominion Energy did not include the potential to use gravity-based and/or suction-bucket foundations in their MMPA application; therefore, NMFS has not analyzed, authorized incidental take, or promulgated mitigation, monitoring, or reporting measures for gravity-based or suction-bucket foundations.

Comment 42: Commenters expressed concern that whales would be displaced from the Project Area into shipping lanes or areas of higher vessel traffic, which could result in higher risks of vessel strike and that NMFS has not accounted for this impact in its analysis.

Response: NMFS acknowledges that whales may temporarily avoid the area where the specified activities occur. However, NMFS does not anticipate that whales will be displaced in a manner that would result in a higher risk of vessel strike, and the commenter does not provide evidence that either of these effects should be a reasonably anticipated outcome of the specified activity. Vessel traffic is concentrated closer to shore as vessels leave and return to ports such as the Port of Virginia, most notably within designated shipping lanes and as they enter the Chesapeake Bay. The density of vessel traffic dissipates as one moves offshore.

NMFS disagrees with the commenter that the risk of vessel strike was not considered in the analysis. NMFS takes the risk of vessel strike seriously and while we acknowledge that vessel strikes can result in injury or mortality, we have analyzed and determined that the potential for vessel strike is so low as to be discountable. Dominion Energy must abide by a suite of vessel strike avoidance measures that include, for

example, seasonal and dynamic vessel speed restrictions to 10 kn (18.5 km/hour) or less; required use of dedicated observers on all transiting vessels; maintaining awareness of North Atlantic right whale presence through monitoring of North Atlantic right whale sighting systems. Further, any observations of a North Atlantic right whale by project-related personnel would be reported to sighting networks, alerting other mariners to North Atlantic right whale presence. Both Dominion Energy and other mariners are required to abide by all existing approach and speed regulations designed to minimize the risk of vessel strike. Notably, Dominion Energy is restricted from installing foundations during the time of year when North Atlantic right whales are expected to be present in greatest abundance (November 1st through April 30th). Therefore, the potential for this activity to result in harassment is very small, as indicated by the low amount of take authorized. Further, NMFS has determined that any harassment from any specified activity is anticipated to, at most, result in some avoidance that would be limited spatially and temporally. It is unlikely that any impacts from the project would increase the risk of vessel strike from non-Dominion Energy vessels. The commenter has presented no information supporting the speculation that whales would be displaced from the Project Area into shipping lanes or areas of higher vessel traffic in a manner that would be expected to result in higher risks of vessel strike.

Comment 43: Commenters stated that it is ''against the law to knowingly interfere with an endangered species and depletion of an entire population,'' and they cited the Endangered Species Act (ESA) in support of this claim. They further state that the CVOW–C Project would ''disrupt'' the migration path of the North Atlantic right whale and, therefore, result in the extinction of this species.

Response: Under Section 7(a)(2) of the ESA, Federal agencies are required to consult with NMFS or the U.S. Fish and Wildlife Service, as appropriate, to ensure that the actions they fund, permit, authorize, or otherwise carry out will not jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitats. For the CVOW–C Project, our office (*i.e.,* the Office of Protected Resources) requested initiation of a Section 7 consultation for ESA-listed species with the NMFS Greater Atlantic Regional Fisheries Office on April 4, 2023. A Biological Opinion was completed on September 19, 2023 (found here: *https://repository.library.noaa.gov/view/noaa/55495*), which concluded that the promulgation of the rule and issuance of LOAs thereunder is not likely to jeopardize the continued existence of threatened and endangered species under NMFS' jurisdiction and is not likely to result in the destruction or adverse modification of designated or proposed critical habitat. Because of this, NMFS' action of finalizing the rulemaking and issuing LOAs for the CVOW–C Project is consistent with the ESA.

Furthermore, NMFS disagrees that the CVOW–C Project would ''completely disrupt and destroy the North Atlantic Right Whale population and migration path,'' as suggested by the commenters. NMFS is aware of no evidence to support this claim, nor did the commenters provide any. In total, the CVOW–C Project Area consists of approximately 456.5 km^2 of the entire 269,448 km^2 migratory BIA. No take by injury, serious injury, or mortality is authorized for the species. NMFS emphasizes that the authorized incidental take of North Atlantic right whales is limited to Level B harassment (*i.e.,* behavioral disturbance). As described in the proposed rule and this final rule (see Negligible Impact Analysis and Determination section), NMFS has determined that the Level B harassment of North Atlantic right will not result in impacts to the population through effects on annual rates or recruitment or survival.

Changes From the Proposed to Final Rule

Since the publication of the proposed rule in the **Federal Register** (88 FR 28656, May 4, 2023), NMFS has made changes, where appropriate, that are reflected in the final regulatory text and preamble text of this final rule. These changes are briefly identified below, with more information included in the indicated sections of the preamble to this final rule.

Changes to Information Provided in the Preamble

The information found in the preamble of the proposed rule was based on the best available information at the time of publication. Since publication of the proposed rule, new information has become available and has been incorporated into this final rule, as discussed below.

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

Given the release of NMFS' final 2022 SARs (Hayes *et al.,* 2023), we have updated the North Atlantic right whale total mortality/serious injury (M/SI) amount from 8.1 to 31.2. This increase is due to the inclusion of undetected annual M/SI in the total annual serious injury/mortality. We have also updated the North Atlantic right whale abundance estimate based on Linden (2023).

Given the availability of new information, we have made updates to the UME summaries for multiple species (*i.e.,* North Atlantic right whale, humpback whale, minke whale).

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

We have added a general requirement that noise levels must not exceed those modeled, assuming 10 dB attenuation.

Because Dominion Energy has informed NMFS that the soft-start procedure in the proposed rule raises engineering feasibility and practicability concerns, we have removed the specific soft-start procedure identified in the proposed rule (*i.e.,* ''four to six strikes per minute at 10 to 20 percent of the maximum hammer energy, for a minimum of 20 minutes''). This final rule still requires a soft-start for each WTG and OSS impact pile driving event.

In Tables 25 and 26, we have added the requirement for clearance and shutdown of pile driving based on PAM detections at 10 km (6.2 mi) that applies to all species except North Atlantic right whales, which would still require shutdown at any distance upon a detection.

We have added a requirement in the *Reporting* section for Dominion Energy to report operational sound levels from all installed piles, in alignment with a requirement from the Biological Opinion.

Changes in the Regulatory Text

We have made the following changes to the regulatory text, which are reflected, as appropriate, throughout this final rule and described, as appropriate, in the preamble.

For clarity and consistency, we revised two paragraphs in § 217.290 Specified activity and specified geographical region of the regulatory text to fully describe the specified activity and specified geographical region.

The following changes are reflected in § 217.294 Mitigation Requirements and the associated Mitigation section of the preamble to this final rule:

For clarity and consistency, we have reorganized and revised, as applicable,

the paragraphs in § 217.294 Mitigation requirements.

We have clarified the requirement that Dominion Energy deploy at least two functional noise abatement systems requires at least a double bubble curtain.

As described above, we updated the WTG and OSS impact pile driving soft-start procedural requirements.

The following changes are reflected in § 217.295 Monitoring and Reporting Requirements and the associated Monitoring and Reporting section of the preamble of this final rule:

For clarity and consistency, we have reorganized and revised, as applicable, the paragraphs in § 217.295 Monitoring and reporting requirements.

We have updated the process for obtaining NMFS approval for PSO and PAM operators to be similar to requirements typically included for seismic (*e.g.,* airgun) surveys and have clarified education, training, and experience necessary to obtain NMFS' approval.

We have added a requirement that the Lead PSO must have a minimum of 90 days of at-sea experience and must have obtained this experience within the last 18 months.

We have added a requirement to have at least three PSOs on pile driving vessels rather than two PSOs, as was originally described in the proposed rule.

We have added requirements that SFV must be conducted on every pile until measured noise levels are at or below the modeled noise levels, assuming 10 dB, for at least three consecutive monopiles.

We have removed the requirement to include HRG survey activities in the weekly report. This requirement is inconsistent with previously promulgated and issued incidental take authorizations for HRG survey activities and a rationale was not included in the preamble of proposed rule to support this change. Consistent with previous authorizations, HRG survey activities are to be included in the annual report (see § 217.295(g)(7)).

We have removed the requirements for reviewing data on an annual and biennial basis for adaptive management and instead will make adaptive management decisions as new information warrants it.

Description of Marine Mammals in the Specified Geographic Region

As noted in the Changes From the Proposed to Final Rule section, updates have been made to the UME summaries of multiple species. These changes are described in detail in the sections below. We have also included new data on North Atlantic right whale abundance information (Linden, 2023) and updated the annual M/SI value presented in Table 2, based upon updates found in the final SARs (see Hayes *et al.,* 2023). Otherwise, this section has not changed since the publication of the proposed rule in the **Federal Register** (88 FR 28656, May 4, 2023).

Several marine mammal species occur within the specified geographic region. Sections 3 and 4 of Dominion Energy's ITA application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species (Dominion Energy, 2023). NMFS fully considered all of this information, and we refer the reader to these descriptions in the application, adopted here by reference, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' SARs (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.,* physical and behavioral descriptions) may be found on NMFS' website (*https://www.fisheries.noaa.gov/find-species*).

Table 2 lists all species or stocks for which take is authorized under this final rule and summarizes information related to the species or stock, including regulatory status under the MMPA, ESA, and PBR, where known. PBR is defined as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS' SARs; (16 U.S.C. 1362(20))). While no mortality is anticipated or 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' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic and Gulf of Mexico SARs. Values presented in Table 2 are the most recent available data at the time of publication which can be found in NMFS' 2022 final SARs (Hayes *et al.,* 2023), available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports.*

TABLE 2—MARINE MAMMAL SPECIES [e] THAT MAY OCCUR IN THE PROJECT AREA AND BE TAKEN, BY HARASSMENT

Common name	Scientific name	Stock	ESA/ MMPA status; strategic (Y/N) [a]	Stock abundance (CV, N_{min}, most recent abundance survey) [b]	PBR	Annual M/SI [c]
Order Artiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)						
Family Balaenidae:						
North Atlantic right whale	*Eubalaena glacialis*	Western Atlantic	E, D, Y	338 (0, 332, 2020); 356 (346–363, 2022) [j].	0.7	[i]31.2
Family Balaenopteridae (rorquals):						
Fin whale	*Balaenoptera physalus*	Western North Atlantic	E, D, Y	6,802 (0.24; 5,573; 2016)	11	1.8
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine	-, -, Y	1,396 (0; 1,380; 2016)	22	12.15
Minke whale	*Balaenoptera acutorostrata*	Canadian Eastern Coastal	-, -, N	21,968 (0.31; 17,002; 2016).	170	10.6
Sei whale	*Balaenoptera borealis*	Nova Scotia	E, D, Y	6,292 (1.02; 3,098; 2016)	6.2	0.8
Family Physeteridae:						
Sperm whale	*Physeter macrocephalus*	North Atlantic	E, D, Y	4,349 (0.28; 3,451; 2016)	3.9	0
Family Kogiidae:						
Pygmy sperm whale [g h]	*Kogia breviceps*	Western North Atlantic	-, -, N	7,750 (0.38; 5,689; 2016)	46	0

TABLE 2—MARINE MAMMAL SPECIES [e] THAT MAY OCCUR IN THE PROJECT AREA AND BE TAKEN, BY HARASSMENT—Continued

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [a]	Stock abundance (CV, N_{min}, most recent abundance survey) [b]	PBR	Annual M/SI [c]
Family Delphinidae:						
Atlantic spotted dolphin	*Stenella frontalis*	Western North Atlantic	-, -, N	39,921 (0.27; 32,032; 2016).	320	0
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Western North Atlantic	-, -, N	93,233 (0.71; 54,433; 2016).	544	27
Bottlenose dolphin	*Tursiops truncatus*	Western North Atlantic—Offshore.	-, -, N	62,851 (0.23; 51,914; 2016).	519	28
		Southern Migratory Coastal	-, -, Y	3,751 (0.6; 185; See SAR).	23	0–18.3
Clymene dolphin [g]	*Stenella clymene*	Western North Atlantic	-, -, N	4,237 (1.03; 2,071; 2016)	21	0
Common dolphin	*Delphinus delphis*	Western North Atlantic	-, -, N	172,974 (0.21; 145,216; 2016).	1,452	390
False killer whale [g]	*Pseudorca crassidens*	Western North Atlantic	-, -, N	1,791 (0.56; 1,154; 2016)	12	0
Melon-headed whale [g]	*Peponocephala electra*	Western North Atlantic	-, -, N	UNK (UNK; UNK; 2016)	UNK	0
Long-finned pilot whale [f]	*Globicephala melas*	Western North Atlantic	-, -, N	39,215 (0.3; 30,627; 2016).	306	29
Short-finned pilot whale [f]	*Globicephala macrorhynchus*	Western North Atlantic	-, -, Y	28,924 (0.24, 23,637, See SAR).	236	136
Pantropical spotted dolphin	*Stenella attenuata*	Western North Atlantic	-, D, N	6,593 (0.52, 4,367, See SAR).	44	0
Risso's dolphin	*Grampus griseus*	Western North Atlantic	-, -, N	35,215 (0.19; 30,051; 2016).	301	34
Family Phocoenidae (porpoises):						
Harbor porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy	-, -, N	95,543 (0.31; 74,034; 2016).	851	16
Order Carnivora—Superfamily Pinnipedia						
Family Phocidae (earless seals):						
Gray seal [d]	*Halichoerus grypus*	Western North Atlantic	-, -, N	27,300 (0.22; 22,785; 2016).	1,389	4,453
Harbor seal	*Phoca vitulina*	Western North Atlantic	-, -, N	61,336 (0.08; 57,637; 2018).	1,729	339

[a] 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.

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

[c] These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.,* commercial fisheries, ship strike).

[d] NMFS' stock abundance estimate (and associated PBR value) applies to the U.S. population only. Total stock abundance (including animals in Canada) is approximately 451,431. The annual M/SI value given is for the total stock.

[e] Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (*https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/;* Committee on Taxonomy (2023)).

[f] Although both species are described here, the authorized take for both short-finned and long-finned pilot whales has been summarized into a single group (pilot whales spp.).

[g] While these species were not originally included in Dominion Energy's request, given recorded sightings/detections of these species during previous Dominion Energy IHAs in the same general area, NMFS included Level B harassment of these species both in the proposed rule and this final rulemaking.

[h] Estimate is for Kogia spp. only.

[i] In the proposed rule (88 FR 28656, May 4, 2023), the best available science (*i.e.,* the NMFS draft 2022 SARs) included a North Atlantic right whale M/SI value of 8.1 which accounted for detected mortality/serious injury. In the final 2022 SAR, released in June 2023, the total annual average observed North Atlantic right whale mortality was updated from 8.1 to 31.2. Numbers presented in this table (31.2 total mortality (22 of which are attributed to fishery-induced mortality) are 2015–2019 estimated annual means, accounting for both detected and undetected mortality and serious injury (Hayes et al., 2023).

[j] The current SAR includes an estimated population (N_{best} 338) based on sighting history through November 2020 (Hayes et al., 2023). In October 2023, NMFS released a technical report identifying that, based on sighting data through December 2022 (versus the SAR which includes sighting data through November 2020), the North Atlantic right whale population size based on sighting history through 2022 was 356 whales, with a 95 percent credible interval ranging from 346 to 363 (Linden, 2023).

A detailed description of the species likely to be affected by the Project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed rule (88 FR 28656, May 4, 2023). Since that time, a new SAR (Hayes *et al.,* 2023) has become available for the North Atlantic right whale. Annual M/SI increased from 8.1 to 31.2. This large increase in annual serious injury/mortality is a result of NMFS including undetected annual M/SI in the total annual M/SI. Additionally, NMFS released a technical report, which includes a recently released population estimate of 356 (Linden, 2023). We are not aware of any additional changes in the status of the species and stocks listed in Table 2; therefore, detailed descriptions are not provided here. Please refer to the proposed rule **Federal Register** notice for these descriptions (88 FR 28656, May 4, 2023). Please also refer to NMFS' website (*https://www.fisheries.noaa.gov/find-species*) for generalized species accounts.

North Atlantic Right Whale

In June 2023, NMFS released its final 2022 SARs, which updated the annual M/SI value from 8.1 to 31.2 due to the addition of estimated undetected mortality and serious injury, as described above, which had not been previously included in the SAR. The

population estimate is slightly lower than the North Atlantic Right Whale Consortium's 2022 Report Card, which identifies the population estimate as 340 individuals (Pettis *et al.,* 2023). Elevated North Atlantic right whale mortalities have occurred since June 7, 2017, along the U.S. and Canadian coast, with the leading category for the cause of death for this UME determined to be ''human interaction,'' specifically from entanglements or vessel strikes. Since publication of the proposed rule, the number of animals considered part of the UME has increased. As of December 19, 2023, there have been 36 confirmed mortalities (dead, stranded, or floaters), 0 pending mortalities, and 34 seriously injured free-swimming whales for a total of 70 whales. As of October 14, 2022, the UME also considers animals (n=51) with sublethal injury or illness (called ''morbidity'') bringing the total number of whales in the UME to 121. More information about the North Atlantic right whale UME is available online at: *https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-north-atlantic-right-whale-unusual-mortality-event.*

Humpback Whale

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine to Florida. This event was declared a UME in April 2017. Partial or full necropsy examinations have been conducted on approximately half of the 212 known cases (as of December 19, 2023). Of the whales examined (approximately 90), about 40 percent had evidence of human interaction, either vessel strike or entanglement (refer to *https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2023-humpback-whale-unusual-mortality-event-along-atlantic-coast*). While a portion of the whales have shown evidence of pre-mortem vessel strike, this finding is not consistent across all whales examined and more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. More information is available at: *https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2023-humpback-whale-unusual-mortality-event-along-atlantic-coast.*

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

Minke Whale

Since January 2017, a UME has been declared based on elevated minke whale mortalities detected along the Atlantic coast from Maine through South Carolina. As of December 19, 2023, a total of 160 minke whales have stranded during this UME. Full or partial necropsy examinations were conducted on more than 60 percent of the whales. Preliminary findings have shown evidence of human interactions or infectious disease in several of the whales, but these findings are not consistent across all of the whales examined, so more research is needed. This UME has been declared non-active and is pending closure. More information is available at: *https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2023-minke-whale-unusual-mortality-event-along-atlantic-coast.*

Phocid Seals

Since June 2022, elevated numbers of harbor seal and gray seal mortalities have occurred across the southern and central coast of Maine. This event was declared a UME in July 2022. Preliminary testing of samples has found some harbor and gray seals are positive for highly pathogenic avian influenza. While the UME is not occurring in the Project Area, the populations affected by the UME are the same as those potentially affected by the Project. However, due to the two states being approximately 677.6 km (421 mi) apart, by water (from the most northern point of Virginia to the most southern point of Maine), NMFS does not expect that this UME would be further conflated by the activities related to the Project. Information on this UME is available online at: *https://www.fisheries.noaa.gov/2022-2023-pinniped-unusual-mortality-event-along-maine-coast.*

The above event was preceded by a different UME, occurring from 2018–2020 (closure of the 2018–2020 UME is pending). Beginning in July 2018, elevated numbers of harbor seal and gray seal mortalities occurred across Maine, New Hampshire, and Massachusetts. Additionally, stranded seals have shown clinical signs as far south as Virginia, although not in elevated numbers, therefore the UME investigation encompassed all seal strandings from Maine to Virginia. A total of 3,152 reported strandings (of all species) occurred from July 1, 2018, through March 13, 2020. Full or partial necropsy examinations have been conducted on some of the seals and samples have been collected for testing. Based on tests conducted thus far, the main pathogen found in the seals is phocine distemper virus. NMFS is performing additional testing to identify any other factors that may be involved in this UME. Information on this UME is available online at: *https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2020-pinniped-unusual-mortality-event-along.*

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.,* Richardson *et al.,* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). 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 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their

associated hearing ranges are provided in Table 3.

TABLE 3—MARINE MAMMAL HEARING GROUPS

(NMFS, 2018)

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

* 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.

NMFS notes that in 2019a, Southall *et al.* recommended new names for hearing groups that are widely recognized. However, this new hearing group classification does not change the weighting functions or acoustic thresholds (*i.e.,* the weighting functions and thresholds in Southall *et al.* (2019a) are identical to NMFS 2018 Revised Technical Guidance). When NMFS updates our Technical Guidance, we will be adopting the updated Southall *et al.* (2019a) hearing group classification.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from the Project's specified activities have the potential to result in the harassment of marine mammals in the specified geographic region. The proposed rule (88 FR 28656, May 4, 2023) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from Dominion Energy's project activities on marine mammals and their habitat. That information and analysis is adopted by reference into this final rule and is not repeated here; please refer to the notice of the proposed rule (88 FR 28656, May 4, 2023).

Since publication of the proposed rule, new scientific information has become available that provides additional insight into the sound fields produced by turbine operation. Recently, Holme *et al.* (2023) stated that Tougaard *et al.* (2020) and Stöber and Thomsen (2021) extrapolated levels for larger turbines and should be interpreted with caution since both studies relied on data from smaller turbines (0.45 to 6.15 MW) collected over a variety of environmental conditions. They demonstrated that the model presented in Tougaard *et al.* (2020) tends to overestimate levels (up to approximately 8 dB) measured to those in the field, especially with measurements closer to the turbine for larger turbines. Holme *et al.* (2023) measured operational noise from larger turbines (6.3 and 8.3 MW) associated with three wind farms in Europe and found no relationship between turbine activity (power production, which is proportional to the blade's revolutions per minute) and noise level, although it was noted that this missing relationship may have been masked by the area's relatively high ambient noise sound levels. Sound levels (root-mean-square (RMS)) of a 6.3 MW direct-drive turbine were measured to be 117.3 dB at a distance of 70 meters. However, measurements from 8.3 MW turbines were inconclusive as turbine noise was deemed to have been largely masked by ambient noise.

Estimated Take

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

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

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

Marine Mammal Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

A summary of all NMFS' thresholds can be found at (*https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*).

Level B Harassment

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

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

Level A Harassment

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

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

TABLE 4—ONSET OF PERMANENT THRESHOLD SHIFT (PTS)

[NMFS, 2018]

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

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

Note: Peak sound pressure level ($L_{p,0\text{-}pk}$) has a reference value of 1 μPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1μPa^2s. In this Table, thresholds are abbreviated to be more reflective of International Organization for Standardization (ISO) standards (ISO, 2017). The subscript ''flat'' is included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (*i.e.,* 7 Hz to 160 kHz). The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.,* varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these thresholds will be exceeded.

Dominion Energy would not conduct high-order detonation of unexploded ordnances or munitions and explosives of concern (UXOs/MECs) as part of the Project. As Dominion Energy has not requested, and NMFS has not authorized, any take related to the detonation of UXOs/MECs, the acoustic (*i.e.,* PTS onset and TTS onset for underwater explosives) and the pressure thresholds (*i.e.,* lung and gastrointestinal tract injuries) are not discussed or included in this action.

Acoustic and Exposure Modeling Methods

As described above, underwater noise associated with the construction of offshore components of CVOW–C would predominantly result from installation of the WTG monopile and the OSS jacket foundations using a dual-vibratory and impact pile driving approach while noise from cable landfall construction activities (*i.e.,* temporary cofferdam and temporary goal post installation and removal) will primarily result from either impact pile driving (for the temporary goal posts) or vibratory pile driving (for the temporary cofferdams). Acoustic modeling was performed for some activities for which there was a pile driving component, including WTG and OSS foundation installation and temporary cofferdam installation and removal. The basic modeling approach is to characterize the sounds produced by the source, determine how the sounds propagate within the surrounding water column,

and then estimate species-specific exposure probability by considering the range- and depth-dependent sound fields in relation to animal movement in simulated representative construction scenarios.

Animat exposure modeling was only performed for foundation installation. For other activities planned by Dominion Energy (*i.e.,* temporary cofferdam installation and removal, temporary goal post installation and removal, HRG surveys), take was estimated using a ''static'' approach for representing animal distribution and density, as detailed later in the *Static Take Estimate Method* section.

Dominion Energy employed Tetra Tech, Inc. (Tetra Tech) to conduct the acoustic modeling and Marine Acoustics, Inc. (MAI) for the animal movement modeling to better understand both the sound fields produced during foundation and cofferdam installation and to estimate any potential exposures (see the Acoustic Modeling report in Appendix A of Dominion Energy's ITA application). Dominion Energy also collaborated with the Institute for Technical and Applied Physics (iTAP) for information related to vibratory pile driving of foundation piles. Tetra Tech also performed the acoustic analysis related to temporary cofferdam installation and removal via vibratory pile driving. Acoustic source modeling of vibratory pile driving related to cofferdam installation and removal was incorporated into the static method to yield estimated and requested take values. Tetra Tech applied the source modeling methods from the CVOW Pilot Project with modifications based on newly available data and the additional availability of research studies. The approach is summarized here; more detail can be found in the Acoustic Modeling report in Appendix A of Dominion Energy's ITA application.

Acoustic Source Modeling

Based on a literature review of pile driving measurement reports, theoretical modeling reports, and peer-reviewed research papers (see the references in Attachment Z–2 in Appendix A of Dominion Energy's COP (2023)), Tetra Tech developed an empirical modeling approach for calculating the acoustic source of impact pile driving foundation installation activities for the CVOW–C Project. A collaboration between Dominion Energy and iTAP assessed the estimated acoustic source levels produced from vibratory pile driving of foundation piles based on empirical data collected and assessed from the CVOW Pilot Project and other European offshore wind farms. These two modeling approaches are discussed separately here.

Foundation Impact Pile Driving Source Level Empirical Model

An empirical model developed by Tetra Tech was used to determine the peak sound level (L_{pk}) and sound exposure level (SEL) at the source for the foundation pile driving scenarios. To feed into the model, Tetra Tech obtained sound levels from relevant scenarios for a variety of pile diameter sizes, driven with hammers of varying energies, and collected or analyzed at different ranges from the impacted pile. This empirical model was implemented by using the following steps:

1. Normalizing the received sound pressure levels to a common received range, assuming a transmission loss of 15LogR (*i.e.,* practical spreading), where R is the distance ratio;

2. Scaling the source levels to an energy of 4,000 kJ, assuming a relationship between the hammer energy and radiated sound as 10 times the base 10 logarithm of the ratio of hammer energy to the referenced hammer energy (as in the scaling laws outlined in von Pein *et al.,* 2022); and

3. Calculating a linear regression of the adjusted source levels (which has been normalized for range and hammer energy) as a function of the base 10 logarithm of the pile diameters, which is then used to predict the broadband SEL and peak sound levels for the planned energy and diameter.

The above empirical model was used in determining L_{pk} and SEL, however, a similar technique for sound pressure level (SPL) was not possible due to a lack of data. For this reason, SPL was derived from SEL using the average pulse duration of measurements used in the empirical model. One-third octave band levels from 12.5 Hz to 20 kHz were derived from surrogate spectra taken from published data for piles of similar diameters and adjusted based on the empirical model above. For the L_{pk} underwater acoustic modeling scenario (evaluating a single pile-driving strike), the pile driving sound source was represented as a point source at a mid-water depth. To estimate SEL, the monopile and pin pile driving scenarios were modeled using a vertical array of point sources spaced at 1 m intervals and assuming a specific number of strikes for each type of pile (see Formula 2 in Attachment Z–1 of Appendix A in the application). The SPL scenario was set up in an identical manner to the SEL scenario, with the primary difference being that the model did not incorporate the total number of pile driving strikes needed for each of the monopile and pin pile scenarios within a 24-hour period. Instead, only a single pile driving strike was incorporated.

Information on the impact pile driving scenarios and source levels for WTGs, OSSs, and goal posts can be found in Table Z–7 of Appendix A of Dominion Energy's ITA application. These impact modeling scenarios assumed no sound attenuation. For all WTG monopile modeling (*i.e.,* Scenarios 1–3 including standard driving and hard-to-drive installation approaches), a single strike SEL source level of 226 was assumed. For OSS modeling using pin piles, a single strike SEL source level of 214 dB was assumed. For goal post installation, a single strike SEL source level of 183 dB was assumed (California Department of Transportation (CALTRANS), 2015).

Foundation Vibratory Pile Driving Source Level Empirical Model

Limited empirical data exists for the installation of large foundation piles by vibratory driving, with most being measured by iTAP (see Remmers and Bellmann (2021) in Appendix A of the application (Attachment Z–3)). Current datasets contain a variety of different information, including ranges of water depths from several meters to depths of 40 m, different sediment types, and measured receiver distances from several meters away from the source up to 750 m away.

To predict the expected underwater noise levels during vibratory pile driving of 2.4 m pin piles for the OSS and 9.5 m monopiles, iTAP used the limited empirical data from several existing offshore wind farms from different pile diameters. All data were normalized to a distance from the source of 750 m assuming a propagation loss of 15LogR. Given this normalization, uncertainties of <3 dB were expected. The data were plotted as a function of the pile diameter and then fit with a statistical regression curve (see the figure in Remmers and Bellmann (2021) Attachment Z–3 in Appendix A of Dominion Energy's application). Using the resulting regression, iTAP predicted noise levels of 151 dB SPL for 2.4 m pin piles and 159 dB SPL for 9.5 m monopiles (the maximum size piles Dominion Energy plans to install), at a range of 750 m from the driven piles (Remmers and Bellmann (2021)). Based on possible influences of friction between the head of the vibratory hammer and the top of the piles, iTAP states that these results at 750 m from the piles may be overestimating the source level for vibratory pile driving.

For vibratory installation of cofferdams, adjusted one-third-octave band source levels (with a broadband source level of 195 dB SEL) were obtained from similar offshore construction projects and then adjusted to account for the estimated force needed to drive cofferdam sheet piles (see Schultz-von Glahn *et al.,* 2006).

Acoustic Propagation Modeling

To predict acoustic levels at range during foundation installation (impact and vibratory pile driving) and temporary cofferdam installation and removal (vibratory pile driving), Tetra Tech used sound propagation models, discussed below. For the installation and removal of goal posts and HRG surveys, Dominion Energy assumed a practical spreading loss rate (15logR). Below we describe the more sophisticated sound propagation modeling methodology.

Tetra Tech utilized a software called dBSea, which was developed by Marshall Day Acoustics (*https://www.dbsea.co.uk/*), to predict the underwater noise in similar environments to what might be encountered in the CVOW–C Project Area. Per Attachment Z–1 of the COP, Tetra Tech used different ''solvers'' (*i.e.,* algorithms) for the low and high-frequency ranges, including:

- *dBSeaPE (Parabolic Equation Method):* The dBSeaPE solver makes use of the range-dependent acoustic model (RAM) parabolic equation method, a versatile and robust method of marching the sound field out in range from the sound source. This method is one of the most widely used in the underwater acoustics community, offers excellent performance in terms of speed and accuracy in a range of challenging scenarios, and was used for low frequencies.
- *dBSeaRay (Ray Tracing Method):* The dBSeaRay solver forms a solution by tracing rays from the source to the receiver. Many rays leave the source covering a range of angles, and the sound level at each point in the receiving field is calculated by coherently summing the components from each ray. This is currently the only computationally efficient method at high frequencies and was used for frequencies of 800 Hz and greater.

Each model utilizes imported environmental data and manually placed noise sources in the aquatic environment, which could consist of either equipment in the standard dBSea database or a user-specific database (*i.e.,* the empirically determined source levels and spectra, discussed above). The software then allows the user to include properties specific to the project site including bathymetry, seabed, and water column characteristics (*e.g.,* sound speed profiles, temperature, salinity, and current). Tetra Tech also incorporated variables for each pile to account for the soft-start of impact pile driving of foundation piles and pile penetration progression.

For the CVOW–C Project's modeled environment using dBSea, bathymetry data were obtained by Tetra Tech from the National Geophysical Data Center and U.S Coastal Relief Model (NOAA Satellite and Information Service, 2020) and consisted of a horizontal resolution of 3 arc seconds (defined as 90 m (295.28 ft)). The data covered an area consisting of 138 km x 144 km (452,755.91 ft x 472,440.94 ft) with a maximum depth of 459 m (1,505.91 ft). Sound sources were placed near the middle of the bathymetry area. The bathymetry data were imported into the dBSea model and extents were set for displaying the received sound levels. Relatedly, sediment data were also included into the model as bottom sedimentation has the potential to directly impact the sound propagation. Dominion Energy's site assessment surveys revealed the Project Area primarily consists of a predominantly sandy seabed. While not reiterated here, Appendix A of Dominion Energy's application contains the tables that include the geoacoustic properties of the sub-bottom sediments for modeling scenarios involving the more offshore WTG and OSS foundations (see Table Z–5) and for the nearshore temporary cofferdams (see Table Z–6).

Given that the sound speed profile in an aquatic environment varies throughout the year, Tetra Tech calculated seasonal sound speed profiles based on the planned installation schedule presented for the CVOW–C Project. Dominion Energy would only install WTG and OSS foundations between May 1st and October 31st, annually, hence an average sound speed profile was calculated for this time period. Sound speed profile data were obtained from the NOAA Sound Speed Manager software incorporating World Ocean Atlantic 2009 extension algorithms. A sensitivity analysis was performed on the monthly sound speed information to determine the most conservative sound modeling results. The average sound speed profile obtained from this dataset was directly included into the dBSea model (see Figure 3 in Attachment Z–1 in Dominion Energy's application (Appendix A)). This same approach was undertaken for temporary cofferdam installation.

The scenarios for WTG monopile and OSS jacket pin pile installation were modeled using a vertical array (based on third-octave band sound characteristics that was adjusted for site-specific parameters, including expected hammer energy and the number of hammers strikes needed per each scenario) of point sources spaced at 1-m intervals. Each of the third octave band center frequencies from 12.5 Hz up to 20 kHz of the source spectra was modeled. In order to conservatively account for the presence of pile driving sound at high-frequencies, a constant 15 dB/decade roll-off is applied to the modeled spectra after the second spectral peak. The spectra source levels for impact driving of monopile and pin piles can be found in Figure 10 of the CVOW–C ITA application. The vibratory pile driving spectra, which is available in Figure 11 of the ITA application, used reference information from iTAP (Gerke and Bellmann, 2012), the California Department of Transportation (CALTRANS, 2015), and from measurements of vibratory driving collected by Tetra Tech. Based on the description above, Tetra Tech determined an appropriate sound speed profile to input into dBSea by pulling the average sound speed profile for the construction period (May 1st to October 31st), following the schedule provided by Dominion Energy. No information was pulled for November 1st through April 30th, as no pile driving is planned due to seasonal restrictions regarding the North Atlantic right whale. The monthly sound speed profile for the planned WTG and OSS foundation construction period is found in Figure 12 in the CVOW–C ITA application.

The sound level estimates are calculated from the generated three-dimensional sound fields and then, at each sampling range, the maximum received level that occurs within the water column is used as the received level at that range. The dBSea model allows for a maximum received level-over-depth approach (*i.e.,* the maximum received level that occurs within the water column at each calculation point). These maximum-over-depth (R_{max}) values are then compared to predetermined threshold levels to determine exposure and acoustic ranges to Level A harassment and Level B harassment threshold isopleths. However, the ranges to a threshold typically differ among radii from a source and also might not be continuous along a radii because sound levels may drop below threshold at some ranges and then exceed threshold at farther ranges. Both the R_{max} (the maximum

range in the model at which the sound level was calculated) and $R_{95\%}$ (excludes ends of protruding areas or small isolated acoustic foci not representative of the nominal ensonified zone) were calculated for each of the relevant regulatory thresholds. The difference between R_{max} and $R_{95\%}$ depends on the source directivity and the heterogeneity of the acoustic environment. To minimize the influence of these inconsistencies, 5 percent of the farthest such footprints were excluded from the model data. The resulting range, $R_{95\%}$, was chosen to identify the area over which marine mammals may be exposed above a given threshold because, regardless of the shape of the maximum-over-depth footprint, the predicted range encompasses at least 95 percent of the horizontal area that would be exposed to sound at or above the specified threshold.

Here we note that Tetra Tech and MAI did not calculate or provide exposure ranges to the Level A harassment SEL_{cum} thresholds in the ITA application as provided by other offshore wind developers in their ITA application. Instead, Dominion Energy chose to utilize acoustic ranges ($R_{95\%}$) values in its analysis, which NMFS concurs is also a reasonable and more conservative approach and likely results in somewhat comparatively larger zones. Dominion Energy's application and this rule include the $R_{95\%}$ ranges as these are representative of the expected underwater acoustic footprints during foundation and cofferdam installation.

Temporary cofferdams followed a similarly described approach. To estimate the distances to the harassment isopleths from the vibratory installation of sheet piles, it was assumed that the vibratory pile driver would use approximately 1,800 kilonewtons of vibratory force over 60 minutes. Given the close proximity of all temporary cofferdams in the nearshore environment and the relatively same installation depth (3.3. m), a single representative location (*i.e.,* the centermost cofferdam) was used for the modeling analysis. As already described above for foundation modeling, the same dBSea process using unique environmental variables and sediment data (*i.e.,* predominantly sand) was applied for cofferdams. Dominion Energy applied a summary sound speed profile to estimate propagation from cable landfall pile driving given this work would most likely occur between May 1st and October 31st. To calculate the ranges to acoustic thresholds, Tetra Tech utilized a maximum received level-over-depth approach where the maximum received sound level that occurs within the water column at each sampling point was used. Tetra Tech calculated both the R_{max} and the $R_{95\%}$ for each of the marine mammal regulatory thresholds.

Animal Movement Modeling

To estimate the probability of exposure of animals to sound above NMFS' harassment thresholds during foundation installation, MAI integrated the sound fields generated from the source and propagation models described above with marine mammal species-typical behavioral parameters (*e.g.,* dive parameters, swimming speed, and course/direction changes). Animal movement modeling was performed for all marine mammal species determined to potentially occur within the CVOW–C Project Area to estimate the amount of potential acoustic exposures above NMFS' Level A (PTS) harassment and Level B (behavioral) harassment thresholds. Animat modeling was conducted for four scenarios (three for WTGs, one for OSS) that were determined to be representative of the types of construction activities expected at three different locations (two for WTGs (one shallow (21 m (69 ft)) and one deep (37 m (121 ft)) location) and one for OSSs (28 m (92 ft))). These locations were selected to appropriately observe the range of effects of sound propagation. The modeled areas are shown in Figure Z–4 in Dominion Energy's Underwater Acoustic Assessment (Appendix A in the application).

MAI's animat modeling was conducted using the Acoustic Integration Model (AIM; Frankel *et al.,* 2002), which is a Monte Carlo based statistical model in which multiple iterations of realistic predictions of acoustic source use as well as animal distribution and movement patterns are conducted to provide statistical predictions of estimated effects from exposure to underwater sound transmissions. By using AIM, each acoustic source and receiver were modeled using the same concept as animats. For each species, separate AIM simulations were developed and iterated for each modeling scenario and activity location. During the simulations, animats were randomly distributed within the model simulation area and the predicted received sound level was estimated every 30 seconds to create a history over a 24-hour period. Animats were also pre-programmed to move every 30 seconds based upon species-specific behaviors. At the end of each 30 second interval, the received sound level (in dB RMS) for each animat was recorded.

Animats that exceed NMFS' acoustic thresholds were identified and the range for the exceedances determined. The output of the simulation is the exposure history for each animat within the simulation, and the combined history of all animats gives a probability density function of exposure during the project. The number of animals expected to exceed the regulatory thresholds is determined by scaling the probability of exposure by the species-specific density of animals in the area. By programming animats to behave like marine species that may be exposed to foundation installation noise during pile driving, the animats are exposed to the sound fields in a manner similar to that expected for real animals.

Static Take Estimate Method

Take estimates from cable landfall construction activities (cofferdam and goal post installation and removal) and HRG surveys were calculated based on a static method (*i.e.,* animal movement modeling was not conducted for these activities). Take estimates produced using the static method are the product of density, ensonified area, and number of days of pile driving work. Specifically, take estimates are calculated by multiplying the expected densities of marine mammals in the activity area(s) by the area of water likely to be ensonified above the NMFS defined threshold levels in a single day (24-hour period). Next that product is multiplied by the number of days pile driving is likely to occur. A summary of this method is illustrated in the following formula:

$$Estimated\ Take = D \times ZOI \times \#\ of\ days$$

Where:

D = average species density (per 100 km^2); and

ZOI = maximum daily ensonified area to relevant thresholds.

This methodology was utilized for impact pile driving associated with goal posts, vibratory pile driving associated with temporary cofferdams, and active acoustic source use from HRG surveys as no exposure modeling was conducted.

Density and Occurrence

In this section, we provide information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. As noted above, depending on the species and activity type, and as described in the Estimated Take section for each activity type, the calculated number of takes and the number of takes that NMFS authorizes is based on the highest estimate of take resulting from

full consideration of density models, average group sizes, or site-specific survey data.

Dominion Energy applied the Duke University Marine Geospatial Ecology Laboratory marine mammal habitat-based density models (*https://seamap.env.duke.edu/models/Duke/EC/*) to estimate take from WTG and OSS foundation installation, temporary goal post installation and removal, temporary cofferdam installation and removal, and HRG surveys.

The Duke habitat-based density models delineate species' density into 5 x 5 km (3.1 x 3.1 mi) grid cells (as opposed to the 10 x 10 km (6.2 x 6.2 mi) grid cells previously used in past Roberts *et al.* datasets for all species, with exception for the North Atlantic right whale). Although the density grid cells are 25 km^2 (9.7 mi^2), the values are still reported per 100 km^2 (38.6 mi^2). Based on the area across which different specified activities are conducted (*i.e.,* WTG and OSS foundation installation, nearshore cable landfall activities, and HRG surveys), appropriate averaged density estimates are applied to exposure and/or take calculations for each area.

For foundation installation, densities were extracted from grid cells within the Lease Area and those extending 8.9 km (5.53 mi) beyond the Lease Area boundaries. The grid cells within the 8.9 km perimeter area were incorporated to account for the largest ensonified area to the Level B harassment threshold; thereby representing the furthest extent where potential impacts to marine mammals could be expected. The density in the grid cells selected were averaged for each month to provide a mean monthly density for each marine mammal species and/or stock. In some cases, the density models combine multiple species (*i.e.,* long-finned and short-finned pilot whales, gray and harbor seals) or stocks (*i.e.,* Southern migratory coastal and the Western North Atlantic offshore bottlenose dolphin stocks), or it may not be possible to derive monthly/seasonal densities for some species so annual densities were used instead (*i.e.,* pantropical spotted dolphins, pilot whale *spp.*).

Group Size and PSO Data Considerations

The exposure estimates from the animal movement modeling or static methods described above directly informed the take estimates. In some cases, adjustments to the density-based exposure estimates may be necessary to fully account for all animals that could be taken during the specified activities. This could consist of an adjustment based on species group size or observations or acoustic detections provided in monitoring reports.

For some species, observational data from PSOs aboard HRG survey vessels indicate that the density-based exposure estimates may be insufficient to account for the number of individuals or type of species that may be encountered during the planned activities. As an example, pantropical spotted dolphins have been included in the requested take request based on prior PSO observation data, obtained via the 2020–2021 monitoring report from under previously issued (and subsequently modified) HRG IHAs to Dominion Energy occurring in and around the Lease Area (see RPS (2018), AIS, Inc. (2020), and RPS (2021)). For other less-common species, the predicted densities from Roberts *et al.* (2023) are very low and the resulting density-based exposure estimate was less than a single animal or a typical group size for the species. In such cases, the mean group size was considered as an alternative to the density-based take estimates to account for potential impacts on a group during an activity.

Regardless of methodology used (*i.e.,* density-based, group size, PSO data), Dominion Energy requested, and NMFS has conservatively authorized, take based on the highest amount of exposures estimated from any given method. Below we present the results of the methodologies described above, including distances to NMFS thresholds, and take estimates associated with each activity.

WTG and OSS Foundation Installation

Here, we present the construction scenarios Dominion Energy applied to its analysis, which NMFS is carrying forward in this rule, and the resulting acoustic ranges to Level A harassment and Level B harassment thresholds, exposure estimates, and take estimates from WTG and OSS foundation installation following the aforementioned modeling methodologies.

To complete the project, Dominion Energy has prepared four foundation installation construction schedules (three for WTG installation and one for OSS installation), as construction schedules cannot be fully predicted due to uncontrollable environmental factors (*e.g.,* weather) and installation schedules include variability (*e.g.,* due to drivability). Since three locations had been identified where OSSs would be constructed, the modeling relied on a single site that would result in further propagation distance. This site was determined to be representative of all three OSS locations.

For the monopile scenarios, two types of pile driving conditions are expected for each monopile installed: a standard pile driving situation (Scenario 1) and a hard-to-drive (Scenario 2) situation. During the installation of one monopile for WTG foundations per day, either a standard or hard-to-drive scenario may be necessary, which would determine the duration of vibratory driving and the number of impact hammer strikes needed. In situations where two monopile WTGs would be installed per day (*i.e.,* Scenario 3), Dominion Energy assumed that only one monopile would consist of a hard-to-drive scenario and the other would always be standard. Dominion Energy has committed to not installing two hard-to-drive foundations in a single day. For OSS jacket foundations, a single installation approach (*i.e.,* Scenario 4; impact pile driving only) is expected for the installation of up to two pin piles per day.

Dominion Energy has assumed that a maximum of two monopiles may be installed per day or that a maximum of two pin piles would be installed per day. No concurrent pile driving would occur. Due to the risk of pile run, Dominion Energy expects to utilize a joint vibratory-impact pile driving installation approach on all WTG and OSS foundation piles. All scenarios, including associated pile driving details, expected to occur can be found in Table 5 below.

TABLE 5—WTG AND OSS FOUNDATION INSTALLATION SCENARIOS

Installation scenario	Foundation installed [c]	Installation details	Duration of installation activity [a]
Scenario 1: Standard Driving	9.5 m diameter monopile foundation (1 pile per day).	Vibratory pile driving	60 minutes.
		Impact pile driving	3,240 hammer strikes (4,000 kJ).

TABLE 5—WTG AND OSS FOUNDATION INSTALLATION SCENARIOS—Continued

Installation scenario	Foundation installed [c]	Installation details	Duration of installation activity [a]
Scenario 2: Hard-to-drive	9.5 m diameter monopile foundation (1 pile per day).	Vibratory pile driving	30 minutes.
		Impact pile driving	3,720 hammer strikes (4,000 kJ).
Scenario 3: One standard and one hard-to-drive [b].	9.5 m diameter monopile foundations (2 piles per day).	Vibratory pile driving	90 minutes.
		Impact pile driving	6,960 hammer strikes (4,000 kJ).
Scenario 4: OSS Jacket Foundation	2.8 m diameter pin piles (2 piles per day).	Vibratory pile driving	120 minutes.
		Impact pile driving	15,120 hammer strikes (3,000 kJ).

[a] The hammer energy of 4,000 kJ represents the maximum hammer energy; however, Dominion Energy anticipates the energy will be less than this.
[b] Two hard-to-drive piles would never be installed on the same day.
[c] Dominion Energy may build up to two foundations per day, consisting of either WTG monopiles or pin piles per jacket foundations. However, on some days, only one monopile may be built per day and would consist of a single standard driven pile or a hard-to-drive pile.

As described above, underwater noise associated with the construction of offshore components of CVOW–C would predominantly result from vibratory and impact pile driving monopile and jacket foundations. As previously described, Dominion Energy employed Tetra Tech to conduct acoustic modeling and MAI to conduct animal movement exposure modeling to better understand sound fields produced during these activities and to estimate exposures. For installation of foundation piles, animal movement modeling was used to estimate exposures.

Presented below are the acoustic ranges to the Level A harassment and Level B harassment thresholds for WTG installation in the deeper environment (Table 6), WTG installation in the shallower water (Table 7), and OSS installation in the single representative location (Table 8). All ranges shown are assuming 10 dB of sound attenuation as Dominion Energy would employ a noise attenuation system (NAS; consisting of at least a double bubble curtain) during all vibratory and impact pile driving of monopile and jacket foundations. Although three attenuation levels were evaluated, and Dominion Energy has not yet finalized its mitigation strategy, Dominion Energy and NMFS both anticipate that the noise attenuation system ultimately chosen will be capable of reliably reducing source levels by 10 dB. Therefore, modeling results assuming 10-dB attenuation are carried forward in this analysis for WTG and OSS foundation installation. See the Mitigation section for more information regarding the justification for the 10 dB assumption.

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Table 6 – Acoustic Ranges ($R_{95\%}$), In Meters, To Level A Harassment (PTS) and Level B Harassment Thresholds For The Deep WTG Location For Marine Mammal Function Hearing Groups, Assuming An Average Sound Speed Profile and 10 dB of Sound Attenuation

Foundation Installation Parameters					Distance to Marine Mammal Thresholds (m)													
					Level A Harassment (PTS)												Level B Harassment (Behavioral)	
					LFC			MFC			HFC			PP			All species	
Installation Scenario	Pile Installed	Installation Approach	Maximum Hammer Energy	Installation duration (minutes)	219 $L_{p, pk}$	183 $L_{E, 24hr}$	199 $L_{E, 24hr}$	230 $L_{p, pk}$	185 $L_{E, 24hr}$	198 $L_{E, 24hr}$	202 $L_{p, pk}$	155 $L_{E, 24hr}$	173 $L_{E, 24hr}$	218 $L_{p, pk}$	185 $L_{E, 24hr}$	201 $L_{E, 24hr}$	160 L_p	120 L_p
Scenario 1: Standard driving	9.5 m diameter monopile (1 pile per day)	Impact	4,000 kJ	85	132	4,396	–[a]	29	170	–[a]	663	2,139	–[a]	141	1,267	–[a]	6,182	–[a]
		Vibratory	n/a	60	–[a]	–[a]	141	–[a]	–[a]	0	–[a]	–[a]	103	–[a]	–[a]	12	–[a]	8,866
Scenario 2: Hard-to-drive	9.5 m diameter monopile (1 pile per day)	Impact	4,000 kJ	99	132	4,980	–[a]	29	187	–[a]	663	2,304	–[a]	141	1,358	–[a]	6,182	–[a]
		Vibratory	n/a	30	–[a]	–[a]	113	–[a]	–[a]	0	–[a]	–[a]	87	–[a]	–[a]	3	–[a]	8,866
Scenario 3: One standard and	9.5 m diameter monopile (2	Impact	4,000 kJ	184	132	5,663	–[a]	29	226	–[a]	663	2,884	–[a]	141	1,756	–[a]	6,182	–[a]
		Vibratory	n/a	90	–[a]	–[a]	158	–[a]	–[a]	0	–[a]	–[a]	125	–[a]	–[a]	31	–[a]	8,866

Foundation Installation Parameters					Distance to Marine Mammal Thresholds (m)													
					Level A Harassment (PTS)												Level B Harassment (Behavioral)	
					LFC			MFC			HFC			PP			All species	
one hard-to-drive	piles per day)																	

***Note**: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds; Lp = root-mean square sound pressure (dB re 1 µPa); L_E = sound exposure level (dB re 1 µPa2 ·s); $L_{p,pk}$ = peak sound pressure (dB re 1 µPa)*

a – Dashes (–) indicate a value that was not calculated by Tetra Tech during the acoustic modeling analysis given the thresholds do not apply (e.g., distances to the peak impulsive threshold was not calculated for vibratory driving).

Table 7 – Acoustic Ranges ($R_{95\%}$), In Meters, To Level A Harassment (PTS) and Level B Harassment Thresholds For The Shallow WTG Location For Marine Mammal Function Hearing Groups, Assuming An Average Sound Speed Profile and 10 dB of Sound Attenuation

Foundation Installation Parameters					Distance to Marine Mammal Threshold (m)													
					Level A Harassment (PTS)												Level B Harassment (Behavioral)	
					LFC			MFC			HFC			PP			All species	
Installation Scenario	Pile Installed	Installation Approach	Maximum Hammer Energy	Installation duration (minutes)	219 $L_{p, pk}$	183 $L_{E, 24hr}$	199 $L_{E, 24hr}$	230 $L_{p, pk}$	185 LE, 24hr	198 $L_{E, 24hr}$	202 $L_{p, pk}$	155 $L_{E, 24hr}$	173 $L_{E, 24hr}$	218 $L_{p, pk}$	185 $L_{E, 24hr}$	201 $L_{E, 24hr}$	160 L_p	120 L_p
Scenario 1: Standard driving	9.5 m diameter monopile (1 pile per day)	Impact	4,000 kJ	85	128	3,138	–[a]	26	99	–[a]	607	1,659	–[a]	138	1,059	–[a]	5,503	–[a]
		Vibratory	n/a	60	–[a]	–[a]	107	–[a]	–[a]	0	–[a]	–[a]	93	–[a]	–[a]	31	–[a]	6,485
Scenario 2: Hard-to-drive	9.5 m diameter monopile (1 pile per day)	Impact	4,000 kJ	99	128	3,363	–[a]	26	108	–[a]	607	1,888	–[a]	138	1,171	–[a]	5,503	–[a]
		Vibratory	n/a	30	–[a]	–[a]	88	–[a]	–[a]	0	–[a]	–[a]	67	–[a]	–[a]	21	–[a]	6,485
Scenario 3: One standard and	9.5 m diameter monopile (2	Impact	4,000 kJ	184	128	4,152	–[a]	26	134	–[a]	607	2,314	–[a]	138	1,464	–[a]	5,503	–[a]
		Vibratory	n/a	90	–[a]	–[a]	135	–[a]	–[a]	0	–[a]	–[a]	110	–[a]	–[a]	36	–[a]	6,485

Foundation Installation Parameters					Distance to Marine Mammal Threshold (m)													
					Level A Harassment (PTS)												Level B Harassment (Behavioral)	
					LFC			MFC			HFC			PP			All species	
one hard-to-drive	piles per day)																	

***Note**: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds; Lp = root-mean square sound pressure (dB re 1 µPa); L_E = sound exposure level (dB re 1 µPa2 ·s); $L_{p,pk}$ = peak sound pressure (dB re 1 µPa)*

a – Dashes (–) indicate a value that was not calculated by Tetra Tech during the acoustic modeling analysis given the thresholds do not apply (e.g., distances to the peak impulsive threshold was not calculated for vibratory driving).

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Table 8 – Acoustic Ranges ($R_{95\%}$), In Meters, To Level A Harassment (PTS) and Level B Harassment Thresholds For The Shallow OSS Location For Marine Mammal Function Hearing Groups, Assuming An Average Sound Speed Profile and 10 dB of Sound Attenuation

Foundation Installation Parameters					Distance to Marine Mammal Thresholds (m)													
					Level A Harassment (PTS)												Level B Harassment (Behavioral)	
					LFC			MFC			HFC			PP			All species	
Installation Scenario	Pile Installed	Installation Approach	Maximum Hammer Energy	Installation duration (minutes)	219 $L_{p, pk}$	183 $L_{E, 24hr}$	199 $L_{E, 24hr}$	230 $L_{p, pk}$	185 $L_{E, 24hr}$	198 $L_{E, 24hr}$	202 $L_{p, pk}$	155 $L_{E, 24hr}$	173 $L_{E, 24hr}$	218 $L_{p, pk}$	185 $L_{E, 24hr}$	201 $L_{E, 24hr}$	160 L_p	120 L_p
Scenario 4: OSS jacket foundation	2.8 m diameter pin pile	Impact	3,000 kJ	410	0	2,680	–[a]	0	48	–[a]	197	1,435	–[a]	0	1,283	–[a]	2,172	–[a]
		Vibratory	n/a	120	–[a]	–[a]	75	–[a]	–[a]	0	–[a]	–[a]	68	–[a]	–[a]	0	–[a]	3,601

***Note**: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds; Lp = root-mean square sound pressure (dB re 1 µPa); L_E = sound exposure level (dB re 1 µPa2 ·s); $L_{p,pk}$ = peak sound pressure (dB re 1 µPa)*

a – Dashes (–) indicate a value that was not calculated by Tetra Tech during the acoustic modeling analysis given the thresholds do not apply (e.g., distances to the peak impulsive threshold was not calculated for vibratory driving).

Dominion Energy provided seasonal density estimates during the time of year when WTG and OSS foundations would be installed following the methodology provided in the *Density and Occurrence* section above. The resulting densities used in the exposure estimate calculations for foundation installation are provided in Table 9.

TABLE 9—MEAN SEASONAL DENSITY ESTIMATES FOR WTG AND OSS FOUNDATION INSTALLATION

[Inclusive of the 8.9 Km perimeter applied for the largest Level B harassment zone from vibratory pile driving]

Marine mammal species	Stock	Mean density (individual/km^2)			
		Spring (May)	Summer (June to August)	Fall (September to October) [c]	Annual density
North Atlantic right whale *	Western North Atlantic	0.00015	0.00004	0.00005	
Fin whale *	Western North Atlantic	0.00069	0.00036	0.00019	
Humpback whale	Gulf of Maine	0.00136	0.00023	0.00040	
Minke whale	Canadian East Coast	0.00519	0.00028	0.00011	
Sei whale *	Nova Scotia	0.00021	0.00001	0.00004	
Sperm whale *	North Atlantic	0.00003	0.00000	0.00000	
Pygmy sperm whale	Western North Atlantic	[a] n/a	[a] n/a	[a] n/a	
Atlantic spotted dolphin	Western North Atlantic	0.00507	0.05873	0.03822	
Atlantic white-sided dolphin	Western North Atlantic	[a] n/a	[a] n/a	[a] n/a	
Bottlenose dolphin [d]	Southern Migratory Coastal	0.13098	0.13509	0.13852	
	Western North Atlantic, Offshore	0.07352	0.07415	0.06439	
Clymene dolphin	Western North Atlantic	[a] n/a	[a] n/a	[a] n/a	
Common dolphin	Western North Atlantic	0.05355	0.00559	0.00103	
False killer whale	Western North Atlantic	[a] n/a	[a] n/a	[a] n/a	
Melon-headed whale	Western North Atlantic	[a] n/a	[a] n/a	[a] n/a	
Long-finned pilot whale [e]	Western North Atlantic	([b])	([b])	([b])	0.00098
Short-finned pilot whale [e]	Western North Atlantic	([b])	([b])	([b])	0.00098
Pantropical spotted dolphin	Western North Atlantic	([b])	([b])	([b])	0.00008
Risso's dolphin	Western North Atlantic	0.00084	0.00042	0.00021	
Harbor porpoise	Western North Atlantic	0.00315	0.00000	0.00000	
Gray seal	Western North Atlantic	0.01828	0.00001	0.00047	
Harbor seal	Western North Atlantic	0.01828	0.00001	0.00047	

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

[a] These species were added to the list of marine mammal species that could potentially be harassed by project activities after the animat analysis was completed so no exposure estimates were calculated. Instead, a standard group size of animals was used instead for any analysis pertaining to this species.

[b] For these species, monthly densities were not available. Instead, annual densities were used.

[c] As no foundation installation is planned to occur in November or December, the relevant values were not included.

[d] Within the Roberts et al. (2023) data, bottlenose dolphin densities are reported as a single ''bottlenose dolphin'' group and are not identified by stock. Given that the WTG and OSS foundation installation would be occurring beyond the 20-m isobath, where the stocks are split, estimated take was assumed to come from the offshore stock.

[e] Pilot whale spp. are reported as a single group (Globicephala spp.) and are not species-specific. Because of this, Dominion Energy assumed that the density was a collective pilot whale group and could be attributed to either the short-finned or long-finned species.

MAI set the modeled marine mammal animats to populate each of the model areas with the representative nominal densities provided. During the modeling, some of the obtained densities were higher than the real-world density, as to ensure that the results of the animat model simulations were not unduly influenced by the spontaneous placement of some of the simulated marine mammals and to provide additional statistical robustness within the modeling exercise. To obtain the final exposure estimates, the modeled results were normalized by the ratio of the modeled animat density to the real-world seasonal densities. The exposure estimates were derived based on the history of exposure within the modeling exercise for each marine mammal species or species group. The modeled SEL received by each animat over the duration of the construction activity period (*e.g.,* estimated 3 hours of driving on a single monopile) and the peak sound pressure level were used to calculate the potential for an individual animat to have experienced PTS, in accordance with the NOAA Fisheries (2018) physiological acoustic thresholds for marine mammals. If an animat was not predicted to have experienced PTS, then the sound energy received by each individual animat over the 24-hour modeled period was used to assess the potential risk of biologically significant behavioral reactions. The modeled RMS sound pressure levels were used to estimate the potential for behavioral responses, in accordance with the NOAA Fisheries (2005b) behavioral criteria.

For the monopile WTG installation, the exposure calculations assumed 176 WTG monopiles would be installed over 2 years, but also took into account the need for Dominion Energy to possibly re-pile for up to 7 WTG foundations (equating to a total of 183 modeled piling events for WTGs). For the jacket foundations using pin piles for the OSSs, the modeling assumed that up to 12 pin piles (4 per OSS for up to 3 total OSSs) would be installed over 2 years. Both of these were modeled in accordance with the schedule provided by Dominion Energy.

Overall, for Year 1 (2024), it was assumed that up to a maximum of 95 monopiles and all 12 pin piles would be installed. For Year 2, it was assumed that a maximum of 88 monopiles (which does account for the 7 possible re-piling events that may be necessary) would be installed. As construction of the WTGs and OSSs are only anticipated to occur in the first 2 years of the project (2024 and 2025), animats were only calculated for these. Although schedule delays due to weather or other unforeseen activities may require Dominion Energy to not complete all piling in Year 2, but instead push a limited number of piles to Year 3 (2026) and/or Year 4 (2027), no modeling was completed for 2026 or 2027. This is because any piles not completed in 2025 (Year 2) would be pushed to 2026 (Year 3) and/or 2027 (Year 4), which means that the current analysis has accounted for the total scenario for foundation installation activities in Year 2 would be less than estimated here and instead would shift some to Years 3 or 4. Please see Table 10 for the derived exposure estimates during WTG and OSS foundation installation over 2 years (2024 and 2025).

The exposure estimates for both the installation of WTGs and OSSs over 2

years (2024 and 2025) were then adjusted, for some species, based on group size characteristics known through the scientific literature and received sighting reports from previous projects and/or surveys. As indicated below, when density-based exposure estimates were lower than numbers that were found in the scientific literature or via real-world sighting reports, these estimates were adjusted by either a standard group size for the species/stock or by PSO observational data. The species-specific requested and authorized take estimates are listed below, in accounting for these adjustments, where applicable:

- *North Atlantic right whale:* Take by Level B harassment for foundation installation adjusted for group size of one individual for months with monthly density <0.01 per 100 km^2 (Roberts *et al.,* 2023) when construction may occur (May–October) and two individuals for months with monthly density >0.01 when construction may occur (May–October);
- *Fin whale:* Adjusted based on PSO data (max daily number × days of activity);
- *Humpback whale:* Adjusted based on PSO data (max daily number × days of activity);
- *Sperm whale:* Adjusted based on one group size per year (three per Barkaszi *et al.,* 2019);
- *Atlantic white-sided dolphin:* Adjusted based on 1 group size per year (15 per Reeves *et al.,* 2002);
- *Pantropical spotted dolphin:* Adjusted based on 1 group size per year (20 per Reeves *et al.,* 2002);
- *Short-beaked common dolphin:* Adjusted based on 1 group size (20 individuals per group) per day (Dominion Energy, 2021);
- *Clymene dolphin:* Adjusted based on one group size (five per AIS, Inc. (2020));
- *False killer whale:* Adjusted based on one group size per year (four per RPS (2021));
- *Melon-headed whale:* Adjusted based on one group size per year (five per RPS (2018)); and
- *Pygmy sperm whale:* Adjusted based on one group size per year (one per RPS (2021)).

In Table 10, we present the calculated exposure estimates and the maximum amount of take authorized during foundation installation of WTGs and OSSs during the 5-year effective period for the CVOW–C Project. As demonstrated by the exposure modeling results, which do not consider mitigation other than the use of a sound attenuation device(s), the potential for Level A harassment is very low. However, there may be some situations where pile driving cannot be stopped due to safety concerns related to pile instability.

As previously discussed, only 176 WTG and 3 OSS (using a maximum of 12 pin piles) foundations would be permanently installed for the CVOW–C Project; however, Dominion Energy has considered the possibility that some piles may be started but not fully installed at some locations due to installation feasibility issues. Conservatively, Dominion Energy has estimated up to seven additional pile driving events may be needed in the event this occurs. Per Dominion Energy's estimated construction schedule, it is anticipated that all of these foundation installation activities would occur in Year 1 (2024) and Year 2 (2025); therefore, the take estimates below reflect the foundation pile driving activities associated with 183 WTG foundations and 3 OSSs, to account for the 7 additional re-piling events that may occur if monopiles were started in one location but then needed to be re-driven at another WTG position.

TABLE 10—EXPOSURES ESTIMATES AND MAXIMUM AMOUNT OF TAKE AUTHORIZED BY LEVEL A HARASSMENT AND LEVEL B HARASSMENT FROM VIBRATORY AND IMPACT PILE DRIVING ASSOCIATED WITH 183 WTG[f] AND 3 OSS TOTAL INSTALLATION EVENTS, ASSUMING 10 dB OF NOISE ATTENUATION

Marine mammal species	Stock	Estimated exposures				Takes authorized			
		2024		2025		2024		2025[e]	
		Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
North Atlantic right whale*[c]	Western North Atlantic	[c]1	3	[c]1	2	0	6	0	6
Fin whale*	Western North Atlantic	4	21	3	19	4	112	3	90
Humpback whale	Gulf of Maine	4	18	4	14	4	29	4	104
Minke whale	Canadian East Coast	8	53	7	48	8	53	7	48
Sei whale*	Nova Scotia	1	3	1	2	1	3	1	2
Sperm whale*	North Atlantic	0	1	0	1	0	3	0	3
Pygmy sperm whale[g]	Western North Atlantic	[a]n/a	[a]n/a	[a]n/a	[a]n/a	0	1	0	1
Atlantic spotted dolphin	Western North Atlantic	0	2,108	0	1,896	0	2,108	0	1,896
Atlantic white-sided dolphin[d]	Western North Atlantic	[h]n/a	[h]n/a	[h]n/a	[h]n/a	0	15	0	15
Bottlenose dolphin[a]	Southern Migratory Coastal	0	0	0	0	0	0	0	0
	Western North Atlantic, Offshore.	0	4,290	0	3,602	0	4,290	0	3,602
Clymene dolphin[g]	Western North Atlantic	[h]n/a	[h]n/a	[h]n/a	[h]n/a	0	5	0	5
Common dolphin	Western North Atlantic	0	594	0	559	0	1,720	0	1,380
False killer whale[g]	Western North Atlantic	[h]n/a	[h]n/a	[h]n/a	[h]n/a	0	4	0	4
Melon-headed whale[g]	Western North Atlantic	[h]n/a	[h]n/a	[h]n/a	[h]n/a	0	5	0	5
Pilot whale *spp.*	Western North Atlantic	0	61	0	50	0	61	0	50
Pantropical spotted dolphin	Western North Atlantic	0	4	0	4	0	20	0	20
Risso's dolphin	Western North Atlantic	0	25	0	23	0	25	0	23
Harbor porpoise	Western North Atlantic	1	23	1	20	1	23	1	20
Gray seal[b]	Western North Atlantic	1	62	1	53	1	62	1	53
Harbor seal[b]	Western North Atlantic	1	62	1	53	1	62	1	53

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

[a] Given foundation installation would be confined to an area beyond the 20-m isobath, all of the estimated take has been allocated to the offshore stock.

[b] The take request for pinnipeds was allocated to an even 50 percent split to each harbor seal and gray seal.

[c] Although Level A harassment exposure estimates were calculated for North Atlantic right whales, Dominion Energy has not requested, nor does NMFS propose to authorize, any take by Level A harassment for this species as the enhanced mitigation measures would reduce these to zero.

[d] Atlantic white-sided dolphins are not expected, but due to shifts in habitat use, have been included in the take request based on a standard group size annually. We note that animat/exposure modeling was not done for this species.

[e] In the event that the construction schedule is delayed in 2025, some WTGs may need to be constructed in 2026 and/or 2027 instead, which would reduce the number of WTGs constructed in 2025 but it would not change the maximum number of takes of marine mammals authorized in this rule. Instead, the values shown here for 2025 would be reduced with the remaining take carried over into 2026 and/or 2027.

[f] This analysis conservatively assumes 183 independent piling events for WTG monopile foundations would occur, although only 176 permanent WTGs would be installed.
[g] While these species were not originally included in Dominion Energy's request, given recorded sightings/detections of these species during previous Dominion Energy IHAs in the same general area, NMFS has included these as species that may be harassed (by Level B harassment only) during the 5-year effective period of this rulemaking.
[h] This species was incorporated after the animat analysis was completed so no take was estimated. Instead, a standard group size of animals was used instead for any analysis pertaining to this species.

Additionally, as previously discussed above in the Description of the Specified Activities section, Dominion Energy's construction schedule may shift during the project due to bad weather or other uncontrollable and unforeseen events, which may require foundation installation to shift and occur in 2026 and/or 2027 instead. However, in this situation, the maximum amount of take authorized would not change; instead, some of the take that would have occurred in 2025 would instead occur in 2026 and/or 2027, which means that the take of marine mammals during 2025 would be less than predicted here, as those takes would be shifted into 2026 and/or 2027.

Cable Landfall Construction

Dominion Energy plans to install and remove both temporary goal posts comprised of steel pipe piles (to guide the placement of casing pipes installed using a trenchless installation method that does not produce noise levels with the potential to result in marine mammal harassment) and temporary cofferdams comprised of steel sheet piles at cable landfall locations.

Temporary Cofferdams

Dominion Energy would install and remove up to nine temporary cofferdams adjacent to the firing range at the State Military Reservation in Virginia Beach using a vibratory hammer. Dominion Energy assumed that a maximum of 6 days would be needed to install and remove a single cofferdam (3 days to install and 3 days to remove). Vibratory pile driving would occur for up to 60 minutes per day (1 hour) and up to 20 sheet piles could be installed per day (each cofferdam would necessitate 30 to 40 sheet piles, depending on the final chosen configuration). Table 11 includes details for the cofferdam scenario.

TABLE 11—TEMPORARY COFFERDAM SCENARIO

Installation scenario	Foundation installed	Installation details	Sound source level (dB re: 1 μPa at 1 m)	Duration of installation activity for a single pile
Cofferdam Installation	Sheet piles	Vibratory pile driving	195 SEL RMS	60 minutes.

Underwater noise associated with the construction of temporary cofferdams would only result from vibratory pile driving of steel sheet piles. As already described previously, Dominion Energy employed Tetra Tech to conduct the acoustic modeling to better understand the sound fields produced during these activities. These results also utilized information provided by iTAP (see Remmers and Bellmann (2021) Attachment Z–3 in Appendix A of Dominion Energy's application).

Following a similar approach to the one described for foundation installation, Tetra Tech calculated the ranges to the defined acoustic thresholds using a maximum received level-over-depth approach where the maximum received sound level that occurs within the water column at each sampling point was used. Tetra Tech calculated both the R_{max} and the $R_{95\neq}$ for each of the marine mammal regulatory thresholds. The results of this analysis are presented below in Table 12 and are presented in terms of the $R_{95\neq}$ range, based on the cofferdam modeling scenario found in Table 11 above. Given the nature of vibratory pile driving and the very small distances to Level A harassment thresholds (0–108 m (0–354 ft); assuming 10 dB of sound attenuation), which accounts for 1 hour of vibratory pile driving per day, vibratory driving is not expected to result in Level A harassment. As Dominion Energy did not request any Level A harassment incidental to the installation and/or removal of sheet piles for temporary cofferdams, and based on these small distances, NMFS is not authorizing any in this action.

TABLE 12—ACOUSTIC RANGES ($R_{95\%}$), IN METERS, TO LEVEL A HARASSMENT (PTS) AND LEVEL B HARASSMENT THRESHOLDS FROM VIBRATORY PILE DRIVING DURING SHEET PILE INSTALLATION FOR MARINE MAMMAL FUNCTION HEARING GROUPS, ASSUMING AN AVERAGE SOUND SPEED PROFILE

Activity	Pile parameters	Approach used	Distance to marine mammal thresholds				
			Level A harassment (PTS)				Level B harassment (behavior)
			LFC (199 SEL)	MFC (198 SEL)	HFC (173 SEL)	PP (201 SEL)	All species (120 SPL RMS)
Temporary Cofferdams.	2.8 m diameter Pin pile.	Vibratory Pile Driving.	108	0	0	0	3,097

Note: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds.

dBSea was used to derive the acoustic ranges to the Level B harassment threshold, assuming no sound attenuation, around the cable landfall site. This included the ensonified area that was truncated by any land, which yielded an area (approximately 1 km^2) smaller than the radius of a circle (assuming 3,097 m). For the vibratory pile driving for temporary cofferdams associated with the sheet pile installation and removal, the daily ensonified area was 29.04 km^2 (11.21 mi^2), based on the acoustic range to the Level B harassment threshold (3,097 m), with a total ensonified area of 4,980 km^2 (1,922.8 mi^2) over 54 days of installation.

Density data from Roberts *et al.* (2023) were mapped within the boundary of the CVOW–C Project Area using geographic information system (GIS) software (ESRI, 2017). To estimate marine mammal density around the temporary cofferdams, the greatest ensonified area was intersected with the density grid cells for each individual species to select all of those grid cells that the ensonified area intersects, representing the furthest extent where potential impacts to marine mammals could be expected. Maximum monthly densities (*i.e.,* the maximum density found in each grid cell) were averaged by season (spring (May), summer (June through August), and fall (September through October). Since the timing of landfall construction activities may vary somewhat from the prepared schedule, the highest average seasonal density from May through October (Dominion Energy's planned construction period for temporary cofferdams) for each species was selected and used to estimate exposures from temporary cofferdam installation and removal (Table 13).

TABLE 13—HIGHEST AVERAGE SEASONAL MARINE MAMMAL DENSITIES FOR NEARSHORE TRENCHLESS INSTALLATION (TEMPORARY COFFERDAM AND TEMPORARY GOAL POST INSTALLATION) ACTIVITIES

Marine mammal species	Stock	Highest average seasonal density (individual/100 km^2)
North Atlantic right whale *	Western North Atlantic	0.024
Fin whale *	Western North Atlantic	0.041
Humpback whale	Gulf of Maine	0.054
Minke whale	Canadian East Coast	0.124
Sei whale *	Nova Scotia	0.015
Sperm whale *	North Atlantic	0.001
Pygmy sperm whale	Western North Atlantic	[a] n/a
Atlantic spotted dolphin	Western North Atlantic	2.370
Atlantic white-sided dolphin	Western North Atlantic	0.325
Bottlenose dolphin	Southern Migratory Coastal	17.054
Clymene dolphin	Western North Atlantic	[a] n/a
Common dolphin	Western North Atlantic	1.808
False killer whale	Western North Atlantic	[a] n/a
Melon-headed whale	Western North Atlantic	[a] n/a
Pilot whale *spp.*	Western North Atlantic	0.065
Pantropical spotted dolphin	Western North Atlantic	0.007
Risso's dolphin	Western North Atlantic	0.030
Harbor porpoise	Western North Atlantic	0.438
Gray seal	Western North Atlantic	1.775
Harbor seal	Western North Atlantic	1.775

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

[a] These species were added to the list of species that could be potentially impacted by the project after the adequate and complete date. However, given the rare occurrence of these species in the Project Area, authorized take was included only for foundation installation, and not for nearshore cable landfall activities.

For some species where little density information is available (*i.e.,* pilot whales), the annual density was used instead. Given overlap with the pinniped density models as the Roberts *et al.* (2023) dataset does not distinguish between some species, a collective ''pinniped'' density was used for both harbor and gray seal species and later split for the take estimates and request (Roberts *et al.,* 2016). This approach was the same as described in the *WTG and OSS Foundation Installation* section. Refer back to Table 13 for the densities used for temporary cofferdam installation and removal.

Given that use of the vibratory hammer during cofferdam installation and removal may occur on up to 6 days per cofferdam (3 days for installation and 3 days for removal), a max total of 54 days was assumed necessary for all 9 cofferdams. To calculate exposures, the highest average seasonal marine mammal densities were multiplied by the daily ensonified area (29.04 km^2) for installation and removal of sheet piles for temporary cofferdams. To yield the total estimated take for the activity, the per day take was multiplied by the ensonified area by the total number of days for the activity. To do this, the ensonified area was overlaid over the Roberts *et al.* (2023) densities to come up with a per day take which was then multiplied by 54 to account for the total number of days. This produced the results shown in Table 14. The product is then rounded, to generate an estimate of the total number of instances of harassment expected for each species over the duration of the work.

Given the small distances to the Level A harassment isopleths, Level A harassment incidental to this activity is not anticipated, even absent mitigation. Therefore, Dominion Energy did not request, and NMFS is not authorizing, Level A harassment related to cofferdam installation and removal.

Calculated take estimates for temporary cofferdams were then adjusted, for some species, based on group size characteristics known through the scientific literature and received sighting reports from previous projects and/or surveys. These group size estimates for cofferdam installation and removal are described below and were incorporated into the estimated take to yield the requested and authorized take estimate:

• *Atlantic spotted dolphin:* Adjusted based on 1 group size per day (20 per Dominion Energy, 2020, Jefferson *et al.,* 2015);

• *Bottlenose dolphin (Combined Southern Migratory Coastal, Western North Atlantic Offshore):* Adjusted based on 1 group size per day (15 per Jefferson *et al.,* 2015); and

• *Common dolphin (short-beaked):* Adjusted based on 1 group size per day (20 per Dominion Energy, 2021).

Given that take by Level B harassment is precautionarily authorized, assuming 2 years of foundation installation, for Clymene dolphins, false killer whales, melon-headed whales, and pygmy sperm whales, and given the nearshore nature of cable landfall activities, no additional takes (and therefore, no group size adjustments) have been authorized for temporary cofferdam installation and removal activities.

Additionally, beyond group size adjustments, some slight modifications were performed for some species, including for harbor seals, gray seals, short- and long-finned pilot whales, and bottlenose dolphins. More specifically, the takes requested were accrued based on a 50/50 split for both pinniped species, as the Roberts *et al.* (2023) data does not differentiate the density by specific pinniped species. The density for pilot whales represents a single group (*Globicephala spp.*) and is not species-specific. Due to the minimal occurrence of both short-finned and long-finned pilot whales to occur in this area due to the shallow water, the requested take was allocated to a collective group, although short-finned pilot whales are more commonly seen in southern waters. Bottlenose dolphin stocks were split by the 20-m isobath cutoff, and then allocated specifically to the coastal stock of bottlenose dolphins (migratory southern coastal) due to the nearshore nature of these activities.

Below we present the estimated take and maximum amount of take authorized during temporary cofferdam installation and removal during the 5-year effective period for the CVOW–C Project (Table 14). Take by Level A harassment was not requested by Dominion Energy, and it is neither expected nor authorized by NMFS. The take authorized accounts for three days for installation and 3 days for removal, for a total of 6 days for each of 9 cofferdams (54 days total). To be conservative, Dominion Energy has requested take, by Level B harassment, based on the highest exposures predicted by the density-based take estimates, with some slight modifications to account for group sizes for some species.

Although North Atlantic right whales do migrate in coastal waters and have been seen off Virginia Beach, Virginia, they are not expected to occur in the nearshore waters where work will be occurring. The amount of work considered here is limited and would be conducted during a time when North Atlantic right whales are less likely to be migrating in this area. The distance to the Level B harassment isopleth (3.1 km) for installation and removal of the sheet piles associated with the cofferdams and the maximum distance to the Level A isopleth (0.11 km) remain in shallow waters in the nearshore environment and for a very short period of time (approximately 1 hour daily); thus, it is unlikely that right whales (or most species of marine mammals considered here) would be exposed to vibratory pile driving during cofferdam installation and removal at levels close to the 120 dB Level B harassment threshold or to the Level A harassment thresholds. Hence, Dominion Energy did not request take of North Atlantic right whales incidental to this activity and NMFS is not authorizing it.

We note that these would be the maximum number of animals that may be harassed during vibratory pile driving for nearshore temporary cofferdams as the analysis conservatively assumes each exposure is a different animal. This is unlikely to be the case for all species shown here but is the most comprehensive assessment of the level of impact from this activity.

TABLE 14—DENSITY-BASED EXPOSURES AND AUTHORIZED TAKE BY LEVEL B HARASSMENT FROM VIBRATORY PILE DRIVING ASSOCIATED WITH TEMPORARY COFFERDAM INSTALLATION AND REMOVAL

Marine mammal species	Stock	Density-based exposures	Authorized takes of marine mammals
		Level B harassment	
North Atlantic right whale *	Western North Atlantic	0.376	0
Fin whale *	Western North Atlantic	0.643	1
Humpback whale	Gulf of Maine	0.847	1
Minke whale	Canadian East Coast	1.945	2
Sei whale *	Nova Scotia	0.235	0
Sperm whale *	North Atlantic	0.016	0
Pygmy sperm whale	Western North Atlantic	[d] n/a	[d] n/a
Atlantic spotted dolphin	Western North Atlantic	37.169	240
Atlantic white-sided dolphin [c]	Western North Atlantic	5.097	5
Bottlenose dolphin	Southern Migratory Coastal	267.462	180
	Western North Atlantic, Offshore	[a] n/a	[a] n/a
Clymene dolphin	Western North Atlantic	[d] n/a	[d] n/a
Common dolphin	Western North Atlantic	28.355	240
False killer whale	Western North Atlantic	[d] n/a	[d] n/a
Melon-headed whale	Western North Atlantic	[d] n/a	[d] n/a
Pilot whale *spp*	Western North Atlantic	1.019	1
Pantropical spotted dolphin	Western North Atlantic	0.110	0
Risso's dolphin	Western North Atlantic	0.470	0
Harbor porpoise	Western North Atlantic	6.869	7
Gray seal [b]	Western North Atlantic	13.919	14
Harbor seal [b]	Western North Atlantic	13.919	14

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

[a] Given cofferdam installation and removal would be confined to an area below the 20-m isobath, all of the estimated take has been allocated to the coastal stock.

[b] The take request for pinnipeds was allocated to an even 50 percent split to each harbor seal and gray seal.
[c] Atlantic white-sided dolphins are not expected, but due to shifts in habitat use, have been included in the take request based on a standard group size annually. We note that animat/exposure modeling was not done for this species.
[d] Given take by Level B harassment was precautionarily authorized during 2 years of foundation installation for these species, no take has been calculated for cable landfall construction activities.

Temporary Goal Posts

To facilitate nearshore, trenchless installation for the export cables to shore, Direct Steerable Pipe Tunneling equipment utilizing a steerable tunnel boring machine would excavate ground while goal posts are used to guide steel casing pipes behind the tunnel boring machine using a pipe thruster. For tunneling and boring activities, only the impact hammer is expected to cause harassment to marine mammals; all other equipment (*i.e.,* pipe thrusting machine, pumps, motors, powerpacks, and drill mud processing system) produces lower source levels. The pipe thrusting machine does not vibrate or produce any noise as it only pushes the casing pipes so no harassment to marine mammals is expected to occur from the use of this equipment. Each temporary goal post, which would be installed via impact pile driving, would consist of 1.07 m (42 in) diameter steel pipe piles. Up to two steel pipes could be installed per day for a total duration of 130 minutes per goal post. The strike rate would require approximately 260 strikes per pile with a strike duration between 0.5 and 2 seconds. Up to 12 goal posts would be needed for each of the 9 Direct Pipe (temporary cofferdam) locations, equating to a total of 108 piles necessary for the goal posts. Removal of the pipe piles would occur at a rate of 2 per day over 54 days to remove all 108 piles. Unlike installation, removal of pipe piles is not expected to cause take of marine mammals as mechanical and/or hydraulic equipment is used that does not produce noise. Because of this, the analysis described below only pertains to the installation of goal posts.

Tetra Tech applied the Level A harassment cumulative PTS criteria to a specific tab (for impact pile driving) spreadsheet (User Spreadsheet) that reflects NOAA Fisheries' 2018 Revisions to Technical Guidance (NOAA Fisheries, 2018a). The User Spreadsheet relies on overriding default values, calculating individual adjustment factors, and using the difference between levels with and without weighting functions for each of the five categories of hearing groups. The new adjustment factors in the spreadsheets allow for the calculation of SEL_{cum} distances and peak sound exposure (PK) distances and account for the accumulation (Safe Distance Methodology) using the source characteristics (duty cycle and speed) after Silve *et al.* (2014).

To calculate the distance to the acoustic threshold for Level B harassment of marine mammals, Tetra Tech utilizing a spread calculation to estimate the horizontal distance to the 160 dB re 1 µPa isopleth:

$$SPL(r) = SL - PL(r)$$

Where:

SPL = sound pressure level (dB re 1 µPa);
r = range (m), SL = source level (dB re 1 µPa m); and
PL = propagation loss as a function of distance (calculated as $20Log_{10}(r)$).

We note that while these methodologies provided by NOAA Fisheries are able to calculate the maximum distances to the Level A harassment and Level B harassment thresholds, these calculations do not allow for the inclusion of site-specific environmental parameters, as was described for activities analyzed through dBSea.

The results of this analysis are presented below in Table 15 and are presented in terms of the $R_{95\%}$ range. Table 15 demonstrates the maximum distances to both the regulatory thresholds for Level A harassment and Level B harassment for each marine mammal hearing group. Given the very small distances to the Level A harassment thresholds (4.5–152 m; assuming 10 dB of sound attenuation), which accounts for 130 minutes (approximately 2.2 hours) of impact pile driving per day, impact driving is not expected to result in Level A harassment. As Dominion Energy did not request any Level A harassment incidental to the installation and/or removal of steel pipe piles for temporary goal posts, and based on these small distances, NMFS is not authorizing any in this action.

TABLE 15—RANGES, IN METERS, TO LEVEL A HARASSMENT (PTS) AND LEVEL B HARASSMENT THRESHOLDS FROM IMPACT PILE DRIVING DURING STEEL PIPE PILE INSTALLATION OF GOAL POSTS FOR MARINE MAMMAL FUNCTION HEARING GROUPS

Activity	Pile parameters	Approach used	Distance to marine mammal thresholds (in meters)				
			Level A harassment (PTS onset)				Level B harassment (behavioral)
			LFC (183 dB SEL_{cum})	MFC (185 dB SEL_{cum})	HFC (155 dB SEL_{cum})	PP (185 dB SEL_{cum})	All (160 dB RMS)
Temporary Goal Posts.	1.07 m diameter Steel Pipe Piles.	Impact Pile Driving.	590.9	21.0	703.8	316.2	1,450

Note: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds.

Given the small distances to Level A harassment isopleths, Level A harassment incidental to this activity is not anticipated, even absent mitigation. Therefore, Dominion Energy is not requesting, and NMFS is no authorizing Level A harassment related to goal post installation. The acoustic ranges to the Level B harassment threshold, assuming no sound attenuation, were used to calculate the ensonified area around the cable landfall site. The Ensonified Area is calculated as the following:

$$Ensonified\ Area = pi \chi r^2,$$

Where:

r is the linear acoustic range distance from the source to the isopleth to the Level B harassment thresholds.

To accurately account for the greatest level of impact (via behavioral harassment) to marine mammals, Tetra Tech applied the evaluated maximum Level B harassment distance (1,450 m) as the basis for determining potential takes. To get an accurate value of the total ensonified area within the aquatic environment, the isopleth was overlaid

on a map to determine if any truncation by land would occur due to the nearshore proximity of the goal posts. For the vibratory pile driving for temporary cofferdams associated with the sheet pile installation and removal, it was assumed that the daily ensonified area was 4.98 km² (1.92 mi²), or a total ensonified area of 268.92 km² (103.83 mi²) over 54 days of installation and removal. The daily ensonified area that resulted from this analysis (4.98 km²) was carried forward into the take estimates as the daily ensonified area.

In the same approach as was undertaken by the temporary cofferdams, the greatest ensonified area was intersected with the density grid cells for each individual species to select all of those grid cells that the ensonified area intersects to estimate the marine mammal density relevant to the temporary goal posts. Maximum monthly densities (*i.e.,* the maximum density found in each grid cell) were averaged by season. Since the timing of landfall construction activities may vary somewhat from the prepared schedule, the highest average seasonal density from May through October (Dominion Energy's planned construction period for temporary goal posts) for each species was selected and used to estimate exposures from temporary goal post installation. For some species where little density information is available (*i.e.,* pilot whale *spp,* pantropical spotted dolphins), the annual density was used instead. Given overlap with the pinniped density models as the Roberts *et al.* (2023) dataset does not distinguish between some species, a collective ''pinniped'' density was used for both harbor and gray seal species and later split for the take estimates and request (Roberts *et al.,* 2016). This approach was the same as described in the temporary cofferdams. Furthermore, given the densities are the same as what was calculated for temporary cofferdams, we refer the reader back to Table 13 above.

To calculate exposures, the highest average seasonal marine mammal densities from Table 16 were multiplied by the daily ensonified area (4.98 km²) for installation and removal of steel pipe piles for temporary goal posts. Given that use of the impact hammer during goal post installation may occur at a rate of 2 pipe piles per day for a total of 54 days (based on 108 total steel pipe piles), the daily estimated take was multiplied by 54 to produce the results shown in Table 16. The product is then rounded, to generate an estimate of the total number of instances of harassment expected for each species over the duration of the work. Again, as previously noted, no take was calculated for the removal of goal posts due to the equipment planned for use.

The take estimates for Level B harassment related to temporary goal post installation were then adjusted, for some species, based on group size characteristics known through the scientific literature and received sighting reports from previous projects and/or surveys. These group size estimates for temporary goal post installation are described below and were incorporated into the estimated take to yield the requested and authorized take estimate:

- *Atlantic spotted dolphin:* Adjusted based on 1 group size per day (20 per Dominion Energy, 2020; Jefferson *et al.,* 2015);
- *Bottlenose dolphin (Southern Migratory Coastal Stock):* Adjusted based on 1 group size per day (15 per Jefferson *et al.,* 2015); and
- *Short-beaked common dolphin:* Adjusted based on 1 group size per day (20 per Dominion Energy, 2021).

Take by Level B harassment is authorized as a precaution assuming 2 years of foundation installation, for Clymene dolphins, false killer whales, melon-headed whales, and pygmy sperm whales. Given the nearshore nature of cable landfall activities, no additional take (and therefore, no group size adjustments) has been authorized for temporary goal post installation and removal activities.

Additionally, beyond group size adjustments, some slight modifications were performed for some species, including harbor seals, gray seals, short- and long-finned pilot whales, and bottlenose dolphins. More specifically, the takes requested were accrued based on a 50/50 split for both pinniped species, as the Roberts *et al.* (2023) data does not differentiate the density by specific pinniped species. The density for pilot whales represents a single group (*Globicephala spp.*) and is not species-specific. Due to the occurrence of both short-finned and long-finned pilot whales in this area, the requested take was allocated to a collective group, although short-finned pilot whales are commonly seen in southern waters. Bottlenose dolphin stocks were split by the 20-m isobath cutoff, and then allocated specifically to the coastal stock of bottlenose dolphins (migratory southern coastal) due to the nearshore nature of these activities. Lastly, due to the size of the Level B harassment isopleth (1,450 m), Dominion Energy has planned a 1,500 m (1,640.4 ft) shutdown zone to exceed this distance. However, given the proximity to land, large whales are not anticipated to occur this close to nearshore activities. Because of the required mitigation zone and the nearshore location of the temporary goal posts, as well as the calculated exposures, which were less than 0.5, Dominion Energy has not requested, and NMFS has not authorized, takes for large whales (*i.e.,* mysticetes and sperm whales).

Below we present the estimated take and maximum amount of take authorized during temporary goal post installation during the 5-year effective period for the CVOW–C Project (Table 16). Take by Level A harassment was not requested by Dominion Energy, and it is not expected or authorized by NMFS. These authorized take estimates take into account 54 days total for temporary goal post activities, including installation and removal, at a rate of 2 steel pipe piles installed per day over 130 minutes.

TABLE 16—DENSITY-BASED EXPOSURES AND AUTHORIZED TAKE BY LEVEL B HARASSMENT FROM IMPACT PILE DRIVING ASSOCIATED WITH TEMPORARY GOAL POST INSTALLATION

Marine mammal species	Stock	Density-based exposures	Authorized take
		Level B harassment	
North Atlantic right whale*	Western North Atlantic	0.065	0
Fin whale*	Western North Atlantic	0.110	0
Humpback whale	Gulf of Maine	0.145	0
Minke whale	Canadian East Coast	0.333	0
Sei whale*	Nova Scotia	0.040	0
Sperm whale*	North Atlantic	0.003	0

TABLE 16—DENSITY-BASED EXPOSURES AND AUTHORIZED TAKE BY LEVEL B HARASSMENT FROM IMPACT PILE DRIVING ASSOCIATED WITH TEMPORARY GOAL POST INSTALLATION—Continued

Marine mammal species	Stock	Density-based exposures	Authorized take
		Level B harassment	
Pygmy sperm whale	Western North Atlantic	[d] n/a	[d] n/a
Atlantic spotted dolphin	Western North Atlantic	6.373	360
Atlantic white-sided dolphin [c]	Western North Atlantic	0.874	1
Bottlenose dolphin	Southern Migratory Coastal	45.862	270
	Western North Atlantic, Offshore	[a] n/a	[a] n/a
Clymene dolphin	Western North Atlantic	[d] n/a	[d] n/a
Common dolphin	Western North Atlantic	4.862	360
False killer whale	Western North Atlantic	[d] n/a	[d] n/a
Melon-headed whale	Western North Atlantic	[d] n/a	[d] n/a
Pilot whale *spp*	Western North Atlantic	0.175	0
Pantropical spotted dolphin	Western North Atlantic	0.019	0
Risso's dolphin	Western North Atlantic	0.081	0
Harbor porpoise	Western North Atlantic	1.178	1
Gray seal [b]	Western North Atlantic	2.387	2
Harbor seal [b]	Western North Atlantic	2.387	2

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

[a] Given temporary goal post installation would be confined to an area below the 20-m isobath, all of the estimated take has been allocated to the coastal stock.

[b] The take request for pinnipeds was allocated to an even 50 percent split to each harbor seal and gray seal.

[c] Atlantic white-sided dolphins are not expected, but due to shifts in habitat use, have been included in the take request based on a standard group size annually. We note that animat/exposure modeling was not done for this species.

[d] Given take by Level B harassment was precautionarily authorized during two years of foundation installation for these species, no take has been calculated for cable landfall construction activities.

We note that these would be the maximum number of animals that may be harassed during impact pile driving for nearshore temporary goal posts as the analysis conservatively assumes each exposure is a different animal. This is unlikely to be the case for all species shown here but is the most comprehensive assessment of the level of impact from this activity.

HRG Surveys

Dominion Energy's HRG survey activities include the use of impulsive (*i.e.,* boomers and sparkers) and non-impulsive (*i.e.,* Compressed High Intensity Radiated Pulse (CHIRP) Sub-bottom Profilers (SBP)) sources (see Table 4 in the proposed rule (88 FR 28656, May 4, 2023) for a representative list of the acoustic sources and their operational parameters). 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 produced by the acoustic sources planned for use, Level A harassment is neither anticipated, even absent mitigation, nor authorized. Consideration of the anticipated effectiveness of the mitigation measures (*i.e.,* pre-start clearance and shutdown measures), discussed in detail below in the Mitigation section, further strengthens the conclusion that Level A harassment is not a reasonably expected outcome of the survey activity. Therefore, the potential for Level A harassment is not evaluated further in this document. Dominion Energy did not request, and NMFS is not authorizing, take by Level A harassment incidental to HRG surveys. Please see Dominion Energy's application for the CVOW–C Project for details of a quantitative exposure analysis (*i.e.,* calculated distances to Level A harassment isopleths and Level A harassment exposures). No serious injury or mortality is anticipated to result from HRG survey activities.

Specific to HRG surveys, in order to better consider the narrower and directional beams of the sources, NMFS has developed a tool for determining the sound pressure level (SPL_{rms}) at the 160-dB isopleth for the purposes of estimating the extent of Level B harassment isopleths associated with HRG survey equipment (NMFS, 2020). This methodology incorporates frequency-dependent absorption and some directionality to refine estimated ensonified zones. Tetra Tech used NMFS' methodology with additional modifications to incorporate a seawater absorption formula and account for energy emitted outside of the primary beam of the source. For sources that operate with different beamwidths, the maximum beam width was used, and the lowest frequency of the source was used when calculating the frequency-dependent absorption coefficient (see Table 4 in the proposed rule (88 FR 28656, May 4, 2023)).

NMFS considers the data provided by Crocker and Fratantonio (2016) to represent the best available information on source levels associated with HRG equipment and, therefore, recommends that source levels provided by Crocker and Fratantonio (2016) be incorporated in the method described above to estimate ranges to the Level A harassment and Level B harassment isopleths. In cases when the source level for a specific type of HRG equipment is not provided in Crocker and Fratantonio (2016), NMFS recommends that either the source levels provided by the manufacturer be used, or, in instances where source levels provided by the manufacturer are unavailable or unreliable, a proxy from Crocker and Fratantonio (2016) be used instead. Tetra Tech utilized the following criteria for selecting the appropriate inputs into the NMFS User Spreadsheet Tool (NMFS, 2018):

(1) For equipment that was measured in Crocker and Fratantonio (2016), the reported source level for the most likely operational parameters was selected.

(2) For equipment not measured in Crocker and Fratantonio (2016), the best available manufacturer specifications were selected. Use of manufacturer

specifications represent the absolute maximum output of any source and do not adequately represent the operational source. Therefore, they should be considered an overestimate of the sound propagation range for that equipment.

(3) For equipment that was not measured in Crocker and Fratantonio (2016) and did not have sufficient manufacturer information, the closest proxy source measured in Crocker and Fratantonio (2016) was used.

The Geo Marine sparker measurements and specifications were provided by the manufacturer. Crocker 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 joules (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 source level; therefore, the single maximum source level value was used for both operational levels of the S-Boom.

Table 17 identifies all the representative survey equipment that operates below 180 kHz (*i.e.,* at frequencies that are audible and have the potential to disturb marine mammals) that may be used in support of planned survey activities and are likely to be detected by marine mammals given the source level, frequency, and beamwidth of the equipment. This table also provides all operating parameters used to calculate the distances to threshold for marine mammals.

TABLE 17—SUMMARY OF REPRESENTATIVE HRG SURVEY EQUIPMENT WITH OPERATING PARAMETERS TO CALCULATE HARASSMENT DISTANCES FOR MARINE MAMMALS

Equipment classification	Survey equipment	Operating frequency (kHz)	Source level (SL_{RMS}) (dB re 1μPa)
Multibeam Echosounder	R2Sonics 2026	170–450	191
Synthetic Aperture Sonar, combined bathymetric/ sidescan.	Kraken Aquapix [a]	337	N/A
Sidescan Sonar	Edgetech 4200 dual frequency [a]	300 and 600	N/A
Parametric SBP	Innomar SES–2000 Medium 100	2–22	241
Non-Parametric SBP	Edgetech 216 CHIRP	2–16	193
	Edgetech 512 CHIRP	0.5–12	177
Medium Penetration SBP	Geo Marine Dual 400 Sparker 800 J [b]	0.25–4	200
	Applied Acoustics S-Boom (Triple Plate Boomer 1000 J).	0.5–3.5	203

Note: dB re 1 μPa m—decibels referenced to 1 MicroPascal at 1 meter; kHz—kilohertz.
[a] Operating frequencies are above marine mammal hearing thresholds.
[b] Source levels for the GeoMarine Dual 400 Sparker (800 J) were provided by the manufacturer for the stacked 400 tip configuration.

Results of modeling using the methodology described above indicated that, of the HRG equipment planned for use by Dominion Energy that has the potential to result in Level B harassment of marine mammals, sound produced by the GeoMarine Dual 400 sparker would propagate furthest to the Level B harassment isopleth (100 m (328 ft); Table 17). For the purposes of take estimation, it was conservatively assumed that sparker would be the dominant acoustic source for all survey days (although, again, this may not always be the case). Thus, the range to the isopleth corresponding to the threshold for Level B harassment and the boomer and sparkers (100 m) were used as the basis of take calculations for all marine mammals. This is a conservative approach, as the actual sources used on individual survey days, or during a portion of a survey day, may produce smaller distances to the Level B harassment isopleth.

TABLE 18—SUMMARY OF REPRESENTATIVE HRG SURVEY EQUIPMENT DISTANCES TO THE LEVEL B HARASSMENT THRESHOLD

Equipment classification	Survey equipment	Distance (m) to Level B harassment threshold
Multibeam Echosounder	R2Sonics 2026	0.3
Synthetic Aperture Sonar, combined bathymetric/ sidescan.	Kraken Aquapix [a]	N/A
Sidescan Sonar	Edgetech 4200 dual frequency [a]	N/A
Parametric SBP	Innomar SES–2000 Medium 100	0.7
Non-Parametric SBP	Edgetech 216 CHIRP	10.2
	Edgetech 512 CHIRP	2.4
Medium Penetration SBP	Geo Marine Dual 400 Sparker 800 J	100.0
	Applied Acoustics S-Boom (Triple Plate Boomer 1000 J).	21.9

Note: dB re 1 μPa m—decibels referenced to 1 MicroPascal at 1 meter; kHz—kilohertz.
[a] Operating frequencies are above marine mammal hearing thresholds.

To estimate densities for the HRG surveys occurring both within the Lease Area and within the Export Cable Routes for the CVOW–C Project based on the Roberts *et al.* (2023) dataset the relevant density models using GIS (ESRI, 2017) were overlaid to the CVOW–C Project Area. The boundary of the CVOW–C HRG Project Area corresponds to the Lease Area and Export Cable Routes, for which the area was not increased due to an additional

perimeter, as was done for foundation installation. For each survey segment, the average densities (*i.e.,* the average density of each grid cell) were averaged by season over the survey duration (spring, summer, fall, and winter) for the entire HRG survey area. The average seasonal density within the HRG survey area was then selected for inclusion into the take calculations. Refer to Table 20 for the densities used for HRG surveys.

As previously stated, of the HRG equipment planned for use by Dominion Energy that has the potential to result in Level B harassment of marine mammals, sound produced by the GeoMarine Dual 400 sparker would propagate furthest to the Level B harassment isopleth (100 m). This maximum range to the Level B harassment threshold and the estimated trackline distance traveled per day by a given survey vessel (*i.e.,* 58 km (36 mi); Table 19), assuming a travel speed of 1.3 kn (1.49 miles per hour), were then used to calculate the daily ensonified area, or zone of influence (ZOI) around the survey vessel.

TABLE 19—SURVEY DURATIONS AND DAILY/ANNUAL TRACKLINE DISTANCES PLANNED TO OCCUR DURING THE CVOW–C PROJECT

Survey year	Survey segment	Number of active survey vessel days	Estimated distances per day (km)	Annual line kilometers
2024	Pre-lay surveys	65	58	3,770
2025	As-built surveys and pre-lay surveys	249		14,442
2026	As-built surveys	58		3,364
2027	Post-construction surveys	368		21,344
2028	Post-construction surveys	368		21,344

The ZOI is a representation of the maximum extent of the ensonified area around a HRG sound source over a 24-hr period. The ZOI for each piece of equipment operating at or below 180 kHz was calculated per the following formula:

$$Mobile\ Source\ ZOI = (Distance/day \times 2r) + pi \times r^2$$

Where:

Distance/day is the maximum distance a survey vessel could travel in a 24-hour period; and

r is the linear distance from the source to the harassment threshold.

The largest daily ZOI (111.6 km² (4.48 mi²)), associated with the use of the sparker, was applied to all planned survey days.

As previously described, this assumes a total length of surveys that will occur within the CVOW–C Project Area as 64,264 km² (24,812.5 mi²). As Dominion Energy is not sure of the exact geographic locations of the survey effort, these values cannot discreetly be broken up between the Lease Area and the Export Cable Routes. However, the values presented in Table 19 provide a comprehensive accounting of the total annual survey effort anticipated to occur.

For HRG surveys, density data from Roberts *et al.* (2023) were mapped within the boundary of the CVOW–C Project Area using GIS software (ESRI, 2017). The boundary of the CVOW–C HRG Project Area corresponds to the Lease Area and Export Cable Routes, for which the area was not increased due to an additional perimeter, as was done for foundation installation. For each survey segment, the average densities (*i.e.,* the average density of each grid cell) were averaged by season over the survey duration (spring, summer, fall, and winter) for the entire HRG survey area. The average seasonal density within the HRG survey area was then selected for inclusion into the take calculations. The potential Level B density-based harassment exposures are estimated by multiplying the average seasonal density of each species within the survey area by the daily ZOI. That product was then multiplied by the number of planned survey days in each sector during the approximately 5-year construction timeframe (refer back to Table 19) and the product was rounded to the nearest whole number. As described above, this is a reasonable, but conservative estimate as it assumes the HRG source that results in the greatest isopleth distance to the Level B harassment threshold would be operated at all times during the entire survey, which may not ultimately occur. These density values are found in Table 20.

TABLE 20—HIGHEST AVERAGE SEASONAL MARINE MAMMAL DENSITIES FOR HRG SURVEY ACTIVITIES

Marine mammal species	Stock	Highest average seasonal density (individual/100 km²)
North Atlantic right whale *	Western North Atlantic	0.095
Fin whale *	Western North Atlantic	0.080
Humpback whale	Gulf of Maine	0.103
Minke whale	Canadian East Coast	0.344
Sei whale *	Nova Scotia	0.038
Sperm whale *	North Atlantic	0.002
Pygmy sperm whale	Western North Atlantic	[a] n/a
Atlantic spotted dolphin	Western North Atlantic	4.649
Atlantic white-sided dolphin	Western North Atlantic	0.678
Bottlenose dolphin	Combined Southern Migratory Coastal, Western North Atlantic Offshore	24.157
Clymene dolphin	Western North Atlantic	[a] n/a
Common dolphin	Western North Atlantic	6.599
False killer whale	Western North Atlantic	[a] n/a
Melon-headed whale	Western North Atlantic	[a] n/a
Pilot whale *spp*	Western North Atlantic	0.065
Pantropical spotted dolphin	Western North Atlantic	0.007

TABLE 20—HIGHEST AVERAGE SEASONAL MARINE MAMMAL DENSITIES FOR HRG SURVEY ACTIVITIES—Continued

Marine mammal species	Stock	Highest average seasonal density (individual/100 km^2)
Risso's dolphin	Western North Atlantic	0.057
Harbor porpoise	Western North Atlantic	1.477
Gray seal	Western North Atlantic	5.402
Harbor seal	Western North Atlantic	5.402

Note: * denotes species listed under the Endangered Species Act.
[a] This species was incorporated after the animat analysis was completed so no take was estimated. Instead, a standard group size of animals was used instead for any analysis pertaining to this species.

For most species or species groups, monthly densities are available, though in some cases insufficient data are available or we are unable to differentiate species groups by individual *genus* (*e.g.,* gray and harbor seals). In these situations, additional adjustments are necessary and are described here. For pinnipeds, the density values derived from the Roberts *et al.* (2023) data were considered unrealistic given a reduced occurrence near the CVOW–C Project Area in the summer (Hayes *et al.,* 2021). Based on information found in Hayes *et al.* (2021), a conservative density estimate of 0.00001 animals/km^2 was used to represent the summer density of both pinniped species within the modeled CVOW–C Project Area and Lease Area plus the 8.9 km perimeter. Any take by Level B harassment derived from these densities would be further split by an even percentage (50/50) for each species. For bottlenose dolphins, due to specific environmental characteristics that were used to partition the Southern Migratory Coastal and Western North Atlantic Offshore stocks, both the coastal and the offshore stocks were divided based on the location of the 20-m isobath. Information by Hayes *et al.* (2021) indicates a boundary between the two stocks at the 20-m isobath located north of Cape Hatteras, North Carolina. Therefore, all bottlenose dolphins whose grid cells were less than the 20-m isobath in the CVOW–C modeling area or within the 8.9 km of the Lease Area were allocated to the Southern Migratory Coastal stock. All density grid cells greater than the 20-m isobath from the CVOW–C modeling area or within the 8.9 km of the Lease Area were allocated to the offshore stock. The number of marine mammals expected to be incidentally taken per day is then calculated by estimating the number of each species predicted to occur within the daily ensonified area (animals/km^2), incorporating the maximum seasonal estimated marine mammal densities as described above. Estimated numbers of each species taken per day across all survey sites are then multiplied by the total number of survey days annually. The product is then rounded, to generate an estimate of the total number of instances of harassment expected for each species over the duration of the survey. A summary of this method is illustrated in the following formula:

$$Estimated\ Take = D \times ZOI \times \#\ of\ days$$

Where:

D is the average seasonal density for each species; and

ZOI is the maximum daily ensonified area to the harassment threshold.

The take estimates were then adjusted, for some species, based on group size and sighting reports from previous projects and/or surveys. These group size estimates for HRG surveys are described below and were incorporated into the estimated take to yield the requested and authorized take estimate:

- *Atlantic white-sided dolphin:* Adjusted based on 1 group size per year (15 per Reeves *et al.,* 2002);
- *Risso's dolphin:* Adjusted based on 1 group size per year (25 per Dominion Energy, 2021; Jefferson *et al.,* 2015);
- *Bottlenose dolphin (Combined Southern Migratory Coastal, Western North Atlantic Offshore):* Adjusted based on 1 group size per day (15 per Jefferson *et al.,* 2015);
- *Pantropical spotted dolphins*: Adjusted based on 1 group size per day (20 individuals);
- *Common dolphins:* Adjusted based on 1 group size per day (20 individuals);
- *Common dolphins:* Adjusted based on 1 group size per year (20 individuals); and
- *Pilot whale spp.:* Adjusted based on 1 group size per year (20 individuals).

Given the very small zone sizes associated with HRG surveys and the lower density/occurrence of these species, no take in addition to that already authorized for foundation installation (which has much larger acoustic ranges) has been authorized for the following species: false killer whales, melon-headed whales, Clymene dolphins, and pygmy sperm whales. Similar to other activities, the density-based exposure estimates were adjusted due to the manner in which density data is presented in the Duke models for harbor seals, gray seals, short- and long-finned pilot whales, and bottlenose dolphins. More specifically, the takes requested were split 50/50 for both pinniped species, as the Roberts *et al.* (2023) data does not differentiate the density by specific pinniped species. The density for pilot whales represents a single group (*Globicephala spp.*) and is not species-specific. Due to the occurrence of both short-finned and long-finned pilot whales in this area, the requested take was allocated to a collective group, although short-finned pilot whales are commonly seen in southern waters. Due to a reduced spatial resolution at the current state of the survey planning, bottlenose dolphin stocks were combined into a single group for both the coastal stock of bottlenose dolphins (Migratory Southern Coastal) and the offshore stock (Western North Atlantic Offshore).

Below we present the maximum amount of take authorized during HRG surveys occurring during the 5-year effective period for the CVOW–C Project (Table 21). Take by Level A harassment was not requested by Dominion Energy, and it is neither expected nor authorized by NMFS. We note that these would be the maximum number of animals that may be harassed during HRG surveys as the analysis conservatively assumes each exposure is a different animal. This is unlikely to be the case for all species shown here but is the most comprehensive assessment of the level of impact from this activity.

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Table 21 – Density-based Estimated and Take Authorized, By Level B Harassment, From HRG Surveys Over 5-years

Marine Mammal Species	Stock	Annual Density-based Exposures From HRG Surveys						Annual Take Authorized From HRG Surveys					
		2024	2025	2026	2027	2028	2029	2024	2025	2026	2027	2028	2029[a]
North Atlantic right whale*	Western North Atlantic	0.318	1.217	0.283	1.798	1.798	0	0	1	0	2	2	0
Fin whale*	Western North Atlantic	0.378	1.448	0.337	2.140	2.140	0	0	1	0	2	2	0
Humpback whale	Gulf of Maine	0.454	1.738	0.405	2.569	2.569	0	0	2	0	3	3	0
Minke whale	Canadian East Coast	0.786	3.012	0.702	4.452	4.452	0	1	3	1	4	4	0
Sei whale*	Nova Scotia	0.144	0.550	0.128	0.813	0.813	0	0	1	0	1	1	0
Sperm whale*	North Atlantic	0.008	0.029	0.007	0.043	0.043	0	0	0	0	0	0	0
Pygmy sperm whale	Western North Atlantic	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]
Atlantic spotted dolphin	Western North Atlantic	13.618	52.168	12.152	77.100	77.100	0	1,300	4,980	1,160	7,360	7,360	0
Atlantic white-sided dolphin	Western North Atlantic	2.397	9.182	2.139	13.571	13.571	0	15	15	15	15	15	0
Bottlenose dolphin	Southern Migratory	109.021	417.634	97.280	617.227	617.227	0	975	3,735	870	5,520	5,520	0

Marine Mammal Species	Stock	Annual Density-based Exposures From HRG Surveys						Annual Take Authorized From HRG Surveys					
		2024	2025	2026	2027	2028	2029	2024	2025	2026	2027	2028	2029[a]
	Coastal and Western North Atlantic - Offshore												
Clymene dolphin	Western North Atlantic	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]
Common dolphin	Western North Atlantic	22.730	87.072	20.282	128.685	128.685	0	1,300	4,980	1,160	7,360	7,360	0
False killer whale	Western North Atlantic	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]
Melon-headed whale	Western North Atlantic	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]	n/a[b]
Pilot whale *spp.*	Western North Atlantic	0.491	1.883	0.439	2.783	2.783	0	20	20	20	20	20	0
Pantropical spotted dolphin	Western North Atlantic	0.053	0.203	0.047	0.300	0.300	0	20	20	20	20	20	0
Risso's dolphin	Western North Atlantic	0.280	1.072	0.250	1.584	1.584	0	25	25	25	25	25	0
Harbor porpoise	Western North Atlantic	5.278	20.218	4.710	29.881	29.881	0	5	20	5	30	30	0

Marine Mammal Species	Stock	Annual Density-based Exposures From HRG Surveys						Annual Take Authorized From HRG Surveys					
		2024	2025	2026	2027	2028	2029	2024	2025	2026	2027	2028	2029[a]
Gray seal	Western North Atlantic	5.070	19.422	4.524	28.704	28.704	0	5	19	5	29	29	0
Harbor seal	Western North Atlantic	5.070	19.422	4.524	28.704	28.704	0	5	19	5	29	29	0

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

a – Although the final rule is effective for 5 full years (from early 2024 to early 2029), no work is anticipated to occur in 2029 which means no take has been requested or authorized for 2029.

b – Given take by Level B harassment was precautionarily authorized during two years of foundation installation for these species, no take has been calculated for HRG survey activities.

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Total Authorized Takes Across All Specified Activities

The number of Level A harassment and Level B harassment takes authorized during WTG and OSS foundation installation, cable landfall construction, and HRG surveys are presented in Table 22. The mitigation and monitoring measures provided in the Mitigation and Monitoring and Reporting sections are activity-specific and are designed to minimize, to the extent practicable, acoustic exposures to marine mammal species.

The take numbers NMFS is authorizing (Tables 22 and 23) are considered the maximum number that could occur for the following key reasons:

- The authorized take accounts for 183 pile driving events when only 176 foundations may be installed. It could be that no piles will require the need to be re-driven.
- The amount of Level A harassment authorized considered the maximum of up to two monopiles per day being installed and used acoustic ranges that do not account for animal movement.
- The number of authorized takes by Level A harassment does not account for the likelihood that marine mammals will avoid a stimulus when possible before the individual accumulates enough acoustic energy to potentially cause auditory injury.
- All take estimates assumed all piles are installed in the month with the highest average seasonal and/or annual densities for each marine mammal species and/or stock based on the construction schedule.
- Dominion Energy assumed the maximum number of temporary cofferdams (up to 9) and goal posts (up to 108) would be installed when, during construction, fewer piles may be installed and, in the case of cofferdams, may not be installed at all (Dominion Energy may use a gravity-cell structure *in lieu* of cofferdams which would not generate noise levels that would result in marine mammal harassment).
- The number of authorized takes by Level B harassment does not account for the effectiveness of the required mitigation and monitoring measures for any species, with the exception of spatio-temporal restrictions on pile driving (*i.e.,* no foundation pile driving from November 1st through April 30th, annually and no foundation pile driving may start during nighttime), and the required use of a noise attenuation device (at least a double bubble curtain; 10 dB of sound attenuation).

The Year 1 authorized take includes HRG surveys, vibratory and impact installation of WTG and OSS foundations, the impact installation and removal of temporary goal posts, and the vibratory installation and removal of temporary cofferdams. Year 2 includes HRG surveys and the vibratory and impact installation of WTG and OSS foundations. Years 3, 4, and 5 each include HRG surveys only. Dominion Energy has noted that Year 3 and Year 4 may include some installation of foundation piles for WTGs if they fall behind their construction schedule. However, if this occurs, this would just reduce the number of WTGs installed in Year 2. Exact durations for HRG surveys in each construction are not given although estimates are provided above and are repeated here: 65 days in 2024, 249 days in 2025, 58 days in 2026, and 368 days in each of 2027 and 2028. These estimates are based on the effort of two concurrently operating survey vessels.

Table 22 shows the authorized take of each species for each year based on the planned activities. Tables 23 and 24 show the total authorized take over 5 years and the maximum take authorized in any one year, respectively.

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Table 22 – Authorized Level A Harassment and Level B Harassment Takes For All Activities Over 5 Years (2024-2029)

Marine Mammal Species	Stock	Total Authorized Annual Take											
		2024[c]		2025[c]		2026		2027		2028		2029[a]	
		Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
North Atlantic right whale*	Western North Atlantic	0	6	0	7	0	0	0	2	0	2	0	0
Fin whale*	Western North Atlantic	4	113	3	91	0	0	0	2	0	2	0	0
Humpback whale	Gulf of Maine	4	130	4	106	0	0	0	3	0	3	0	0
Minke whale	Canadian East Coast	8	56	7	51	0	1	0	4	0	4	0	0
Sei whale*	Nova Scotia	1	3	1	3	0	0	0	1	0	1	0	0
Sperm whale*	North Atlantic	0	3	0	3	0	0	0	0	0	0	0	0
Pygmy sperm whale[b]	Western North Atlantic	0	1	0	1	0	0	0	0	0	0	0	0
Atlantic spotted dolphin	Western North Atlantic	0	4,008	0	6,876	0	1,160	0	7,360	0	7,360	0	0
Atlantic white-sided dolphin	Western North Atlantic	0	36	0	30	0	15	0	15	0	15	0	0

Marine Mammal Species	Stock	Total Authorized Annual Take											
		2024[c]		2025[c]		2026		2027		2028		2029[a]	
		Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
Bottlenose dolphin	Western North Atlantic - Offshore	0	4,290	0	3,602	0	0	0	0	0	0	0	0
	Southern Migratory Coastal	0	450	0	0	0	0	0	0	0	0	0	0
	Southern Migratory Coastal and Western North Atlantic - Offshore	0	975	0	3,735	0	870	0	5,520	0	5,520	0	0
Clymene dolphin[b]	Western North Atlantic	0	5	0	5	0	0	0	0	0	0	0	0
Common Dolphin	Western North Atlantic	0	3,620	0	6,360	0	1,160	0	7,360	0	7,360	0	0
False killer whale[b]	Western North Atlantic	0	4	0	4	0	0	0	0	0	0	0	0
Melon-headed whale[b]	Western North Atlantic	0	5	0	5	0	0	0	0	0	0	0	0

Marine Mammal Species	Stock	Total Authorized Annual Take											
		2024[c]		2025[c]		2026		2027		2028		2029[a]	
		Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment	Level A harassment	Level B harassment
Pilot whale *spp.*	Western North Atlantic	0	82	0	70	0	20	0	20	0	20	0	0
Pantropical spotted dolphin	Western North Atlantic	0	40	0	40	0	20	0	20	0	20	0	0
Risso's dolphin	Western North Atlantic	0	50	0	48	0	25	0	25	0	25	0	0
Harbor porpoise	Gulf of Maine/Bay of Fundy	1	36	1	40	0	5	0	30	0	30	0	0
Gray seal	Western North Atlantic	1	83	1	72	0	5	0	29	0	29	0	0
Harbor seal	Western North Atlantic	1	83	1	72	0	5	0	29	0	29	0	0

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

a – Although the final rule will be effective for 5 full years (from early 2024 to early 2029), no work is anticipated to occur in 2029 which means no take has been requested or authorized for 2029.

b – While these species were not originally included in Dominion Energy's request, given recorded sightings/detections of these species during previous Dominion Energy IHAs in the same general area, NMFS has included these as species that may be harassed (by Level B harassment only) during the five-year effective period of this final rulemaking.

c – Either 2024 or 2025 represent the maximum amount of take that is authorized annually, specific to each species and/or stock.

Table 23 – Total 5-Year Takes Of Marine Mammals (By Level A Harassment And Level B Harassment) Authorized For All Activities (2024-2029)

Marine Mammal Species	Stock	NMFS Stock Abundance	5-Year Totals		
			Authorized Level A Harassment	Authorized Level B Harassment	5-year Total (Level A + Level B)
North Atlantic right whale*	Western North Atlantic	338[a]	0	17	17
Fin whale*	Western North Atlantic	6,802	7	208	215
Humpback whale	Gulf of Maine	1,396	8	242	250
Minke whale	Canadian East Coast	21,968	15	116	131
Sei whale*	Nova Scotia	6,292	2	8	10
Sperm whale*	North Atlantic	4,349	0	6	6
Pygmy sperm whale[b]	Western North Atlantic	7,750	0	2	2
Atlantic spotted dolphin	Western North Atlantic	39,921	0	26,764	26,764
Atlantic white-sided dolphin	Western North Atlantic	93,233	0	111	111
Bottlenose dolphin	Western North Atlantic - Offshore	62,851	0	7,892	7,892
	Southern Migratory Coastal	6,639	0	450	450
	Southern Migratory Coastal and Western North Atlantic - Offshore	69,490	0	16,620	16,620
Clymene dolphin[b]	Western North Atlantic	4,237	0	10	10
Common dolphin	Western North Atlantic	172,974	0	25,860	25,860
False killer whale[b]	Western North Atlantic	1,791	0	8	8

Marine Mammal Species	Stock	NMFS Stock Abundance	5-Year Totals		
			Authorized Level A Harassment	Authorized Level B Harassment	5-year Total (Level A + Level B)
Melon-headed whale[b]	Western North Atlantic	n/a	0	10	10
Pilot whale *spp.*	Western North Atlantic	39,215	0	212	212
Pantropical spotted dolphin	Western North Atlantic	6,593	0	140	140
Risso's dolphin	Western North Atlantic	35,215	0	173	173
Harbor porpoise	Gulf of Maine/Bay of Fundy	95,543	2	141	143
Gray seal	Western North Atlantic	27,300	2	218	220
Harbor seal	Western North Atlantic	61,336	2	218	220

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

a – NMFS notes that, even using the maximum estimate presented in the 2021 North Atlantic Right whale Report Card (Pettis et al., 2022; n=350; nmin=336 with 95 percent confidence interval +/- 14), the total percentage of this species that would be taken by Level B harassment only over the 5-year period of the final rule would be two percent of the overall population of North Atlantic right whales. While NMFS acknowledges the estimate found on the North Atlantic Right Whale Consortium's website (https://www.narwc.org/report-cards.html), we have used the value presented in the final 2022 SARs (88 FR 54592, August 11, 2023, https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports; nbest=338) as the best available science for this final action.

b – While these species were not originally included in Dominion Energy's request, given recorded sightings/detections of these species during previous Dominion Energy IHAs in the same general area, NMFS has included these as species that may be harassed (by Level B harassment only) during the 5-year effective period of this final rulemaking.

In making the negligible impact determination, NMFS assesses both the greatest number of authorized takes of each marine mammal species or stocks that could occur within any one year, which in the case of this rule is based on the predicted take in either Year 1 (2024) or Year 2 (2025), and the total taking of each marine mammal species or stock during the five-year effective period of the rule. In this calculation, the maximum estimated number of Level A harassment takes in any one year is summed with the maximum estimated number of Level B harassment takes in any one year for each species to yield the highest number of estimated takes that could occur in any year. We recognize that certain activities could shift within the 5-year effective period of the rule; however, the rule allows for that flexibility and the takes are not expected to exceed those shown in Table 24 in any one year.

Table 24 – Maximum Number Of Takes (Level A Harassment and Level B Harassment) Authorized For Any One Year Relative To Stock Population Size

Marine Mammal Hearing Group and Species	Stock	NMFS Stock Abundance	Maximum Annual Take Authorized[d]			
			Maximum Level A Harassment Authorized In Any One Year	Maximum Level B Harassment Authorized In Any One Year	Maximum Annual Take (Maximum Level A Harassment + Maximum Level B Harassment) Authorized In Any One Year	Total Percent Of Stock Authorized To Be Taken In Any One Year Based on Maximum Annual Take[a]
North Atlantic Right Whale*	Western North Atlantic	338[b]	0	7	7	2.07
Fin Whale*	Western North Atlantic	6,802	4	113	117	1.72
Humpback Whale	Gulf of Maine	1,396	4	130	134	9.60
Minke Whale	Canadian East Coast	21,968	8	56	64	0.29
Sei Whale*	Nova Scotia	6,292	1	3	4	0.06
Sperm Whale*	North Atlantic	4,349	0	3	3	0.07
Pygmy Sperm Whale[c]	Western North Atlantic	7,750	0	1	1	0.01
Atlantic Spotted Dolphin	Western North Atlantic	39,921	0	7,360	7,360	18.44
Atlantic White-sided Dolphin	Western North Atlantic	93,233	0	36	36	0.04
Bottlenose Dolphin	Western North Atlantic - Offshore	62,851	0	4,290	4,290	6.83
	Southern Migratory Coastal	6,639	0	450	450	6.78
	Southern Migratory Coastal and	69,490	0	5,520	5,520	7.94

Marine Mammal Hearing Group and Species	Stock	NMFS Stock Abundance	Maximum Annual Take Authorized[d]			
			Maximum Level A Harassment Authorized In Any One Year	Maximum Level B Harassment Authorized In Any One Year	Maximum Annual Take (Maximum Level A Harassment + Maximum Level B Harassment) Authorized In Any One Year	Total Percent Of Stock Authorized To Be Taken In Any One Year Based on Maximum Annual Take[a]
	Western North Atlantic - Offshore					
Clymene Dolphin[c]	Western North Atlantic	4,237	0	5	5	0.12
Common Dolphin	Western North Atlantic	172,974	0	7,360	7,360	4.25
False killer Whale[c]	Western North Atlantic	1,791	0	4	4	0.22
Melon-headed Whale[c]	Western North Atlantic	n/a	0	5	5	n/a
Pilot Whale *spp.*	Western North Atlantic	39,215	0	82	82	0.21
Pantropical Spotted Dolphin	Western North Atlantic	6,593	0	40	40	0.61
Risso's Dolphin	Western North Atlantic	35,215	0	50	50	0.14
Harbor Porpoise	Gulf of Maine/Bay of Fundy	95,543	1	40	41	0.04
Gray Seal	Western North Atlantic	27,300	1	83	84	0.31
Harbor Seal	Western North Atlantic	61,336	1	83	84	0.14

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

a – Calculations of percentage of stock taken are based on the maximum authorized Level A harassment take in any one year + the total authorized Level B harassment take in any one year and then compared against the best available abundance estimate, as shown in Table 2 and 24. For this final action, the best available abundance estimates are derived from the NMFS' final 2022 SARs (88 FR 54592, August 11, 2023, https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports).

b – NMFS notes that, even using the maximum estimate presented in the 2021 North Atlantic Right whale Report Card (Pettis et al., 2022; n=350; nmin=336 with 95 percent confidence interval +/- 14), the total percentage of this species that would be taken by Level B harassment only over the 5-year period of the final rule will be two percent of the overall population of North Atlantic right whales. While NMFS acknowledges the estimate found on the North Atlantic Right Whale Consortium's website (https://www.narwc.org/report-cards.html), we have used the value presented in the final 2022 SARs (88 FR 54592, August 11, 2023, https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports; nbest=338) as the best available science for this final action.

c – While these species were not originally included in Dominion Energy's request, given recorded sightings/detections of these species during previous Dominion Energy IHAs in the same general area, NMFS has included these as species that may be harassed (by Level B harassment only) during the 5-year effective period of this final rulemaking.

d – This value assumes that each instance of take is a different individual, which is not likely the case for all species, as described in the ***Negligible Impact Analysis and Determination*** *section.*

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Mitigation

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

In order to promulgate a rulemaking under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable adverse impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (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, personnel safety, practicality of implementation, and, in the case of a military readiness activity, impact on the effectiveness of the military readiness activity.

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

Generally speaking, the mitigation measures considered and required here fall into three categories: spatio-temporal (seasonal and daily) work restrictions, real-time measures (shutdown, clearance, and vessel strike avoidance), and noise attenuation/reduction measures. Spatio-temporal restrictions, such as seasonal work restrictions, are designed to avoid or minimize operations when marine mammals are concentrated or engaged in behaviors that make them more susceptible or make impacts more likely. Such restrictions reduce both the number and severity of potential takes and are effective in reducing both chronic (longer-term) and acute effects. Real-time measures, such as implementation of shutdown and clearance zones, as well as vessel strike avoidance measures, are intended to reduce the probability or severity of harassment by taking steps in real time once a higher-risk scenario is identified (*e.g.,* once animals are detected within an impact zone). Noise attenuation measures, such as bubble curtains, are intended to reduce the noise at the source, which reduces both acute impacts, as well as the contribution to aggregate and cumulative noise that may result in longer-term chronic impacts.

Below, we briefly describe the required training, coordination, and vessel strike avoidance measures that apply to all specified activities and then we describe the measures that apply to specific specified activities (*i.e.,* foundation installation, nearshore installation and removal activities for cable laying, and HRG surveys). Specific requirements can be found in Section 217.294 (Mitigation requirements) as found in Part 217—Regulations Governing The Taking And Importing Of Marine Mammals at the end of this rulemaking.

Training and Coordination

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

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

North Atlantic Right Whale Awareness Monitoring

Dominion Energy must use available sources of information on North Atlantic right whale presence, including daily monitoring of the Right Whale Sightings Advisory System, monitoring of U.S. Coast Guard very high frequency (VHF) Channel 16 throughout each day to receive notifications of any sightings, and information associated with any regulatory management actions (*e.g.,* establishment of a zone identifying the need to reduce vessel speeds). Maintaining daily awareness and coordination affords increased protection of North Atlantic right whales by understanding North Atlantic right whale presence in the area through ongoing visual and passive acoustic monitoring efforts and opportunities (outside of Dominion Energy's efforts),

and allows for planning of construction activities, when practicable, to minimize potential impacts on North Atlantic right whales.

Vessel Strike Avoidance Measures

This final rule contains numerous vessel strike avoidance measures that reduce the risk that a vessel and marine mammal could collide. While the likelihood of a vessel strike is generally low, they are one of the most common ways that marine mammals are seriously injured or killed by human activities. Therefore, enhanced mitigation and monitoring measures are required to avoid vessel strikes to the extent practicable. While many of these measures are proactive intending to avoid the heavy use of vessels during times when marine mammals of particular concern may be in the area, several are reactive and occur when a project personnel sights a marine mammal. The mitigation requirements are described generally here and in detail in the regulation text at the end of this final rule (see 50 CFR 217.294(b)). Dominion Energy will be required to comply with these measures except under circumstances when doing so would create an imminent and serious threat to a person or vessel or to the extent that a vessel is unable to maneuver and because of the inability to maneuver, the vessel cannot comply.

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

All project vessels, regardless of size, must maintain the following minimum separation zones: 500 m from North Atlantic right whales; 100 m from sperm whales and non-North Atlantic right whale baleen whales; and 50 m from all delphinid cetaceans and pinnipeds (an exception is made for those species that approach the vessel (*i.e.,* bow-riding dolphins)). If any of these species are sighted within their respective minimum separation zone, the underway vessel must shift its engine to neutral and the engines must not be engaged until the animal(s) has been observed to be outside of the vessel's path and beyond the respective minimum separation zone. If a North Atlantic right whale is observed at any distance by any project personnel or acoustically detected, project vessels must reduce speeds to 10 kn (11.5078 miles per hour (mph)). Additionally, in the event that any project-related vessel, regardless of size, observes any large whale (other than a North Atlantic right whale) within 500 m of an underway vessel, the vessel is required to shift engines into neutral. The vessel shall remain in neutral until the North Atlantic right whale has moved beyond 500 m and the 10 kn speed restriction will remain in effect as outlined in 50 CFR 217.294(b).

All of the project-related vessels are required to comply with existing NMFS vessel speed restrictions for North Atlantic right whales and the measures within this rulemaking for operating vessels around North Atlantic right whales and other marine mammals. When NMFS vessel speed restrictions are not in effect and a vessel is traveling at greater than 10 kn, in addition to the required dedicated visual observer, Dominion Energy is required to monitor the crew transfer vessel transit corridor (the path crew transfer vessels take from port to any work area) in real-time with PAM prior to and during transits. To maintain awareness of North Atlantic right whale presence, vessel operators, crew members, and the marine mammal monitoring team would monitor U.S. Coast Guard VHF Channel 16, WhaleAlert, the Right Whale Sighting Advisory System (RWSAS), and the PAM system. Any marine mammal observed by project personnel must be immediately communicated to any on-duty PSOs, PAM operator(s), and all vessel captains. Any North Atlantic right whale or large whale observation or acoustic detection by PSOs or PAM operators must be conveyed to all vessel captains.

All vessels would be equipped with an AIS and Dominion Energy must report all MMSI numbers to NMFS Office of Protected Resources prior to initiating in-water activities. Dominion Energy would submit a NMFS-approved North Atlantic Right Whale Vessel Strike Avoidance Plan at least 180 days prior to commencement of vessel use. Dominion Energy's compliance with these measures will reduce the likelihood of vessel strike to the extent practicable. These measures increase awareness of marine mammals in the vicinity of project vessels and require project vessels to reduce speed when marine mammals are detected (by PSOs, PAM, and/or through another source, *e.g.,* RWSAS) and maintain separation distances when marine mammals are encountered. While visual monitoring is useful, reducing vessel speed is one of the most effective, feasible options available to reduce the likelihood of and effects from a vessel strike. Numerous studies have indicated that slowing the speed of vessels reduces the risk of lethal vessel collisions, particularly in areas where right whales are abundant and vessel traffic is common and otherwise traveling at high speeds (Vanderlaan and Taggart, 2007; Conn and Silber, 2013; Van der Hoop *et al.,* 2014; Martin *et al.,* 2015; Crum *et al.,* 2019).

Seasonal and Daily Restrictions

Spatio-temporal work restrictions in places where marine mammals are concentrated, engaged in biologically important behaviors, and/or present in sensitive life stages are effective measures for reducing the magnitude and severity of human impacts. Seasonal work restrictions provide additional benefit for marine mammals during periods where there could be higher occurrence or presence in the Project Area and specified geographic area. Dominion Energy proposed, and NMFS is requiring, seasonal work restrictions to minimize the risk of noise exposure to North Atlantic right whales incidental to certain specified activities to the extent practicable. These seasonal work restrictions are expected to greatly reduce the number of takes of North Atlantic right whales. These seasonal restrictions also afford protection to other marine mammals that are known to use the Project Area with greater frequency from November 1st through April 30th, including other baleen whales.

As described previously, Dominion Energy proposed, and NMFS is requiring, that no foundation pile driving activities occur November 1st through April 30th. Dominion Energy has planned to construct the cofferdams and goal posts from May 1st through October 31st within the first year of the effective period of the regulations and LOA. However, NMFS is not requiring any seasonal restrictions due to the relatively short duration of work and low associated impacts to marine mammals. Although North Atlantic right whales do migrate in coastal waters, they do not typically migrate very close to shore off of Virginia and/or within Virginia nearshore environments where work would be

occurring. Given the distance to the Level B harassment isopleth is conservatively modeled at approximately 3.1 km (vibratory pile driving for cofferdams) and 1.5 km (impact pile driving of goal posts), any exposure to pile driving during cofferdams and goal posts installation would be at levels closer to the 120-dB Level B harassment threshold and not at louder source levels. NMFS is not adding seasonal restrictions to HRG surveys given the limited duration in which survey effort would occur (*i.e.,* 65 days in 2024; 249 days in 2025; 58 days in 2026; and 368 days in each of 2027 and 2028 (assuming each day an individual vessel is operating constitutes a day of vessel effort)) and the limited impacts expected from HRG surveys on marine mammals.

North Atlantic right whales may be present in and around the Project Area throughout the year (*e.g.,* Davis *et al.,* 2017; Roberts *et al.,* 2023; Salisbury *et al.,* 2015). However, it would not be practicable to restrict foundation pile driving year-round. Based upon the best scientific information available (Roberts *et al.,* 2023), the highest densities of North Atlantic right whales in the specified geographic region are expected during the months of January through April, with densities starting to increase in November and taper off in May. To further ensure impacts to North Atlantic right whales are minimized, Dominion Energy proposed, and NMFS is carrying forward in this final rule, a requirement to not install foundations in November. Specifically, during Dominion Energy's planned foundation pile driving window, May represents the highest density period of North Atlantic right whales, even though it is relatively low when compared to other high-density months.

As described previously, no foundation pile driving activities may occur November 1st through April 30th. Dominion Energy has planned to construct the cofferdams and goal posts from May 1st through October 31st within the first year of the effective period of the regulations and LOA. However, NMFS is not requiring any seasonal restrictions due to the relatively short duration of work and low associated impacts to marine mammals. Although North Atlantic right whales do migrate in coastal waters, they do not typically migrate very close to shore off of Virginia and/or within Virginia nearshore environments where work would be occurring. Given the distance to the Level B harassment isopleth is conservatively modeled at approximately 3.1 km (vibratory pile driving for cofferdams) and 1.5 km (impact pile driving of goal posts), any exposure to pile driving during cofferdams and goal posts installation would be at levels closer to the 120-dB Level B harassment threshold and not at louder source levels. NMFS is not adding seasonal restrictions to HRG surveys; however, Dominion Energy would only perform a predetermined amount of 24-hour survey effort for a specific number of days within specific years (*i.e.,* 65 days in 2024; 249 days in 2025; 58 days in 2026; and 368 days in each of 2027 and 2028 (assuming each day an individual vessel is operating constitutes a day of vessel effort)).

NMFS is also requiring spatio-temporal restrictions for some activities. Within any 24-hour period, Dominion Energy would be limited to installing a maximum of two monopile WTG foundations (one standard and one hard-to-drive) or two pin piles for OSS jacket foundations, although some days Dominion Energy would only install one monopile foundation for WTGs. NMFS notes that Dominion Energy did not request to initiate foundation pile driving during nighttime hours. Because of this, Dominion Energy would only initiate foundation pile driving (inclusive of both vibratory and impact) during daylight hours within their specific pile driving window (*i.e.,* May 1st through October 31st), defined as no earlier than 1 hour after civil sunrise and no later than 1.5 hours before civil sunset. Because of this, no nighttime pile driving (defined as pile driving beginning after defined nighttime hours) is expected to occur during the effective period of the rule. However, Dominion Energy may continue pile driving after dark if installation of the same pile began during daylight hours (*i.e.,* 1.5 hours before civil sunset). In either situation, Dominion Energy would still need to adequately monitor all relevant zones to ensure the most effective mitigative actions are being undertaken, in alignment with an Alternative Monitoring Plan that would be submitted to NMFS for approval prior to foundation pile driving beginning. This Plan would be made public on NMFS' website upon approval. Subsequent monitoring reports submitted by Dominion Energy will allow NMFS to continue to evaluate the efficacy of the technologies and methodologies and to initiate adaptive management approaches, if necessary. We also continue to encourage Dominion Energy to further investigate and test advanced technology detection systems.

Any and all vibratory pile driving associated with cofferdams and goal posts installation and removal would only be able to occur during daylight hours. Lastly, given the very small Level B harassment zone associated with HRG survey activities and no anticipated or authorized Level A harassment, NMFS is not requiring any daily restrictions for HRG surveys.

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

Noise Abatement Systems

Dominion Energy is required to employ NAS, also known as noise attenuation systems, during all foundation installation (inclusive of vibratory and impact pile driving) to reduce the sound pressure levels that are transmitted through the water in an effort to reduce ranges to acoustic thresholds and minimize, to the extent practicable, any acoustic impacts resulting from these activities. Noise abatement systems, such as bubble curtains, are used to decrease the sound levels radiated from a source. Bubbles create a local impedance change that acts as a barrier to sound transmission. The size of the bubbles determines their effective frequency band, with larger bubbles needed for lower frequencies. There are a variety of bubble curtain systems, confined or unconfined bubbles, and some with encapsulated bubbles or panels. Attenuation levels also vary by type of system, frequency band, and location. Small bubble curtains have been measured to reduce sound levels but effective attenuation is highly dependent on depth of water, current, and configuration and operation of the curtain (Austin *et al.,* 2016; Koschinski and Lüdemann, 2013). Bubble curtains vary in terms of the sizes of the bubbles and those with larger bubbles tend to perform a bit better and more reliably, particularly when deployed with two separate rings (Bellmann, 2014; Koschinski and Lüdemann, 2013; Nehls *et al.,* 2016). Encapsulated bubble systems (*i.e.,* Hydro Sound Dampers (HSDs)), can be effective within their targeted frequency ranges (*e.g.,* 100–800 Hz), and when used in conjunction with a bubble curtain appear to create the greatest attenuation. The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices.

The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design

as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. Dähne *et al.* (2017) found that single bubble curtains that reduce sound levels by 7 to 10 dB reduced the overall sound level by approximately 12 dB when combined as a double bubble curtain for 6-m steel monopiles in the North Sea. During installation of monopiles (consisting of approximately 8-m in diameter) for more than 150 WTGs in comparable water depths (>25 m) and conditions in Europe indicate that attenuation of 10 dB is readily achieved (Bellmann, 2019; Bellmann *et al.,* 2020) using single big bubble curtains for noise attenuation. As a double bubble curtain is required to be used (noting a single bubble curtain is not allowed), Dominion Energy is required to maintain numerous operational performance standards. These standards are defined in the regulatory text at the end of this rulemaking, and include, but are not limited to, construction contractors must train personnel in the proper balancing of airflow to the bubble ring and Dominion Energy must submit a performance test and maintenance report to NMFS within 72 hours following the performance test. Corrections to the attenuation device to meet regulatory requirements must occur prior to use during foundation installation activities. In addition, a full maintenance check (*e.g.,* manually clearing holes) must occur prior to each pile being installed. If Dominion Energy uses a noise mitigation device in addition to a double bubble curtain, similar quality control measures are required.

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

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

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

Clearance and Shutdown Zones

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

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

Prior to the start of certain specified activities (foundation installation, cofferdam install and removal, HRG surveys), Dominion Energy must ensure designated areas (*i.e.,* clearance zones; see Tables 25, 26, 27, 28, and 29) are clear of marine mammals prior to commencing activities to minimize the potential for and degree of harassment. For foundation installation, PSOs must visually monitor clearance zones for marine mammals for a minimum of 60 minutes, where the zone must be confirmed free of marine mammals at least 30 minutes directly prior to commencing these activities. Clearance and shutdown zones have been developed in consideration of modeled distances to relevant PTS thresholds with respect to minimizing the potential for take by Level A harassment. All required clearance and shutdown zones for large whales are larger than the largest modeled acoustic range ($R_{95\%}$) distances to thresholds corresponding to Level A harassment (SEL and peak). For foundation installation, the minimum visibility zone would extend 2,000 m from the WTG monopile or OSS pin piles. This is larger than the distance 1,750 m shutdown zone used during the construction of the two CVOW Pilot Project turbines (then called the ''exclusion zone''), given larger piles and higher hammer energy planned for use, which creates a larger distance to the Level A harassment threshold (see proposed rule for more information). Even with the larger acoustic ranges produced from Tetra Tech's conservative modeling for the CVOW–C project, the minimum visibility zone does not differ greatly from those presented for other nearby projects which calculated distances to thresholds in consideration of animal movement (*i.e.,* off of New Jersey for both the Ocean Wind 1 final rule—1.65 km (1.03 mi) in the summer and 2.5 km (1.56 mi) in the winter (see 88 FR 62898, September 13, 2023) and the Atlantic Shores South proposed rule—1.9 km (1.2 mi; see 88 FR 65430, September 22, 2023)).

For cofferdam and goal post pile driving and HRG surveys, monitoring must be conducted for 30 minutes prior to initiating activities and the clearance zones must be free of marine mammals during that time.

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

Once an activity begins, any marine mammal entering their respective shutdown zone would trigger the

activity to cease. In the case of pile driving, the shutdown requirement may be waived if it is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or if the lead engineer determines there is pile refusal or pile instability. In situations when shutdown is called for during foundation pile driving but Dominion Energy determines shutdown is not practicable due to aforementioned emergency reasons, reduced hammer energy must be implemented when the lead engineer determines it is practicable. Specifically, pile refusal or pile instability could result in not being able to shut down pile driving immediately. Pile refusal occurs when the pile driving sensors indicate the pile is approaching refusal, and a shut-down would lead to a stuck pile which then poses an imminent risk of injury or loss of life to an individual, or risk of damage to a vessel that creates risk for individuals. Pile instability occurs when the pile is unstable and unable to stay standing if the piling vessel were to ''let go.'' During these periods of instability, the lead engineer may determine a shutdown is not feasible because the shutdown combined with impending weather conditions may require the piling vessel to ''let go'' which then poses an imminent risk of injury or loss of life to an individual, or risk of damage to a vessel that creates risk for individuals. Dominion Energy must document and report to NMFS all cases where the emergency exemption is taken.

After shutdown, foundation pile driving may be reinitiated once all clearance zones are clear of marine mammals for the minimum species-specific periods, or, if required to maintain pile stability, at which time the lowest hammer energy must be used to maintain stability. If pile driving has been shut down due to the presence of a North Atlantic right whale, pile driving must not restart until the North Atlantic right whale has neither been visually nor acoustically detected for 30 minutes. Upon re-starting pile driving, soft-start protocols must be followed if pile driving has ceased for 30 minutes or longer.

The clearance and shutdown zone sizes vary by species and are shown in Tables 25 and 26, 27, 28, and 29 for each planned activity. Dominion Energy is allowed to request modification to these zone sizes pending results of sound field verification (see regulatory text at the end of this rulemaking). Any changes to zone size would be part of adaptive management and would require NMFS' approval.

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Table 25 – Mitigation Zone Distances During Vibratory And Impact Pile Driving Of WTG Monopile Foundations, Assuming The Maximum Daily Build-Out (Two Piles Installed Per Day) And Deep Water Conditions (Inclusive Of 10 dB Of Sound Attenuation)

Marine Mammals	WTG Monopile Foundations[a, b]							
	Impact Pile Driving Installation				Vibratory Pile Driving Installation			
	Clearance Zone (m)[d]		Shutdown Zone (m)[d]		Clearance Zone (m)[d]		Shutdown Zone (m)[d]	
	One Pile Per Day	Two Piles Per Day	One Pile Per Day	Two Piles Per Day	One Pile Per Day	Two Piles Per Day	One Pile Per Day	Two Piles Per Day
North Atlantic right whale - PAM detection	Any distance							
North Atlantic right whale - visual detection								
All species (other than North Atlantic right whale) - PAM detection	10,000[c]							
All other Mysticetes and sperm whales - visual detection	5,100	6,500	1,750	1,750	1,000	1,000	1,000	1,000
Dolphins and pilot whales - visual detection	500	500	500	500	250	250	250	250
Harbor porpoises	750	750	750	750	500	500	500	500
Seals - visual detection	500	500	500	500	250	250	250	250

a – The minimum visibility zone, an area in which marine mammals must be able to be visually detected, extends 2.0 km.
b – Dominion Energy may request modification of these zones based on the results of sound field verification.
c – To align with the regulatory text, NMFS has added a 10 km PAM monitoring zone for all species.
d - This zone applies to both visual and PAM.

Table 26 – Mitigation Zone Distances During Vibratory And Impact Pile Driving Of OSS Jacket Foundations, Assuming The Maximum Daily Build-Out (Two Pin Piles Installed Per Day; Inclusive Of 10 dB Of Sound Attenuation)

Marine Mammals	OSS Jacket Foundations[a, b]							
	Impact Pile Driving Installation				Vibratory Pile Driving Installation			
	Clearance Zone (m)[d]		Shutdown Zone (m)[d]		Clearance Zone (m)[d]		Shutdown Zone (m)[d]	
	One Pile Per Day	Two Piles Per Day	One Pile Per Day	Two Piles Per Day	One Pile Per Day	Two Piles Per Day	One Pile Per Day	Two Piles Per Day
North Atlantic right whale - PAM detection	Any distance							
North Atlantic right whale - visual detection								
All species (other than North Atlantic right whale) - PAM detection	10,000[c]							
All other Mysticetes and sperm whales - visual detection	5,100	6,500	1,750	1,750	1,000	1,000	1,000	1,000
Dolphins and pilot whales - visual detection	500	500	500	500	250	250	250	250
Harbor porpoises - visual detection	750	750	750	750	500	500	500	500
Seals - visual detection	500	500	500	500	250	250	250	250

a – The minimum visibility zone, an area in which marine mammals must be able to be visually detected, extends 2.0 km.
b – Dominion Energy may request modification of these zones based on the results of sound field verification.
c – To align with the regulatory text, NMFS has added a 10 km PAM monitoring zone for all species.
d - This zone applies to both visual and PAM.

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TABLE 27—DISTANCES TO MITIGATION ZONES DURING NEARSHORE CABLE LANDFALL ACTIVITIES

[Temporary Cofferdams]

Marine mammals	Installation and removal of temporary cofferdams	
	Clearance zone (m)	Shutdown zone (m)
North Atlantic right whale—visual detection	Any distance	
All other Mysticetes and sperm whales	1,000	1,000
Delphinids	250	100
Pilot whales	1,000	1,000
Harbor porpoises	250	100
Seals	250	100

TABLE 28—DISTANCES TO MITIGATION ZONES DURING NEARSHORE CABLE LANDFALL ACTIVITIES

[Temporary goal posts]

Marine mammals	Installation and removal of temporary goal posts	
	Clearance zone (m)	Shutdown zone (m)
North Atlantic right whale—visual detection	Any distance	
All other Mysticetes and sperm whales	1,000	1,000
Delphinids	250	100
Pilot whales	1,000	1,000
Harbor porpoises	750	100
Seals	500	100

TABLE 29—DISTANCES TO THE MITIGATION ZONES DURING HRG SURVEYS

Marine mammals	HRG surveys	
	Clearance zone (m)	Shutdown zone (m)
North Atlantic right whale—visual detection	500	500
Endangered species (excluding North Atlantic right whales)	500	500
All other marine mammals[a]	100	100

[a] Exceptions are noted for delphinids from genera Delphinus, Lagenorhynchus, Stenella, Tursiops, and both seal species.

Soft-Start/Ramp-Up

The use of a soft-start or ramp-up procedure is believed to provide additional protection to marine mammals by warning them or providing them with a chance to leave the area prior to the hammer or HRG equipment operating at full capacity. Soft-start typically involves initiating hammer operation at a reduced energy level (relative to full operating capacity) followed by a waiting period. Dominion Energy must utilize a soft-start protocol for impact pile driving of foundation piles (monopiles and pin piles). Typically, NMFS requires a soft-start procedure of the applicant performing four to six strikes per minute at 10 to 20 percent of the maximum hammer energy, for a minimum of 20 minutes. NMFS notes that it is difficult to specify a reduction in energy for any given hammer because of variation across drivers and installation conditions. However, Dominion Energy's engineers have expressed concern with this approach as it could potentially damage the impact pile driving hammer. As such, specific soft start protocols considering final design details, including site-specific soil properties and other considerations, will be incorporated into the LOA, if issued. Dominion Energy, with approval from NMFS, may also modify the soft start procedures through adaptive management.

HRG survey operators are required to ramp-up sources when the acoustic sources are used unless the equipment operates on a binary on/off switch. The ramp-up would involve starting from the smallest setting to the operating level over a period of approximately 30 minutes. No soft-start or ramp-up is required for nearshore cable landfall activities given the type of activity (*i.e.,* vibratory pile driving for cofferdams) and the short duration of the activity (*i.e.,* impact pile driving of goal posts).

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

Fishery Monitoring Surveys

While the likelihood of Dominion Energy's fishery monitoring surveys impacting marine mammals is minimal, NMFS requires Dominion Energy to adhere to gear and vessel mitigation measures to reduce potential impacts to the extent practicable. In addition, all crew undertaking the fishery monitoring survey activities are required to receive protected species identification training prior to activities occurring and attend

the aforementioned onboarding training. The specific requirements that NMFS has set for the fishery monitoring surveys can be found in the regulatory text at the end of this rulemaking.

Based on our evaluation of the mitigation measures, as well as other measures considered by NMFS, NMFS has determined that these measures will provide the means of affecting the least practicable adverse impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

As noted in the Changes From the Proposed to Final Rule section, we have added, modified, or clarified a number of monitoring and reporting measures since the proposed rule. These changes are described in detail in the sections below and, otherwise, the marine mammal monitoring and reporting requirements have not changed since the proposed rule.

In order to promulgate a rulemaking for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for 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/or
- Mitigation and monitoring effectiveness.

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

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

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

Dominion Energy is required to employ NMFS-approved PSOs and PAM operators. PSOs are trained professionals who are tasked with visual monitoring for marine mammals during pile driving and HRG surveys. The primary purpose of a PSO is to carry out the monitoring, collect data, and, when appropriate, call for the implementation of mitigation measures. In addition to visual observations, NMFS requires Dominion Energy to conduct PAM by PAM operators during foundation pile driving and vessel transit. The inclusion of PAM, which would be conducted by NMFS-approved PAM operators, following a standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind, alongside visual data collection is valuable to provide the most accurate record of species presence as possible and, together, these two monitoring methods are well understood to provide best results when combined (*e.g.,* Barlow and Taylor, 2005; Clark *et al.,* 2010; Gerrodette *et al.,* 2011; Van Parijs *et al.,* 2021). Acoustic monitoring (in addition to visual monitoring) increases the likelihood of detecting marine mammals within the shutdown and clearance zones of project activities, which when applied in combination with required shutdowns helps to further reduce the risk of marine mammals being exposed to sound levels that could otherwise result in acoustic injury or more intense behavioral harassment.

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

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

NMFS will provide PSO and PAM operator approvals in the context of the need to ensure that PSOs and PAM operators have the necessary training and/or experience to carry out their duties competently. In order for PSOs

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

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

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

A minimum number of PSOs would be required to actively observe for the presence of marine mammals during certain project activities with more PSOs required as the mitigation zone sizes increase. A minimum number of PAM operators would be required to actively monitor for the presence of marine mammals during foundation installation. The types of equipment required (*e.g.,* big eyes on the pile driving vessel) are also designed to increase marine mammal detection capabilities. Specifics on these types of requirements can be found in the regulations at the end of this rulemaking. In summary, at least three PSOs and one PAM operator per acoustic data stream (equivalent to the number of acoustic buoys) must be on-duty and actively monitoring per platform during foundation installation; at least two PSOs must be on duty during cable landfall construction impact vibratory pile installation and removal (temporary cofferdams and temporary goal posts); at least one PSO must be on-duty during HRG surveys conducted during daylight hours; and at least two PSOs must be on-duty during HRG surveys conducted during nighttime.

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

Dominion Energy is required to submit a Pile Driving Marine Mammal Monitoring Plan and a PAM Plan to NMFS 180 days in advance of foundation installation activities. The Plan must include details regarding PSO and PAM monitoring protocols and equipment proposed for use. More specifically, the PAM Plan must include a description of all proposed PAM equipment, address how the proposed passive acoustic monitoring must follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind as described in *NOAA and BOEM Minimum Recommendations for Use of Passive Acoustic Listening Systems in Offshore Wind Energy Development Monitoring and Mitigation Programs* (Van Parijs *et al.,* 2021). NMFS must approve the plan prior to foundation installation activities commencing. Specific details on NMFS' PSO or PAM operator qualifications and requirements can be found in Part 217—Regulations Governing The Taking And Importing Of Marine Mammals at the end of this rulemaking. Additional information can be found in Dominion Energy's PSMMP found with their ITA application on NMFS' website at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.*

Sound Field Verification (SFV)

Dominion Energy must conduct SFV measurements for all foundation pile-driving activities associated with the installation of, at minimum, the first 3 monopile foundations, and for all 3 jacket foundations used for OSS, assuming all 12 pin piles are installed (n=4 pin piles per OSS). SFV measurements must continue until at least three consecutive monopiles demonstrate distances to thresholds are at or below those modeled, assuming 10 dB of attenuation. Subsequent SFV measurements are also required should larger piles be installed, or additional piles be driven that are anticipated to produce longer distances to harassment isopleths than those previously measured (*e.g.,* higher hammer energy, greater number of strikes, *etc.*). The measurements and reporting associated with SFV can be found in the regulatory text at the end of this rulemaking. The requirements are extensive to ensure monitoring is conducted appropriately and the reporting frequency is such that Dominion Energy is required to make adjustments quickly (*e.g.,* ensure bubble curtain hose maintenance, check bubble curtain air pressure supply, add additional sound attenuation, *etc.*) to ensure marine mammals are not experiencing noise levels above those considered in this analysis. For recommended SFV protocols for impact pile driving, please consult the ISO 18406 *Underwater acoustics—Measurement of radiated underwater sound from percussive pile driving* (International Organization for Standardization, 2017).

Reporting

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

NMFS would require standardized and frequent reporting from Dominion Energy during the life of the regulations and LOA. All data collected relating to the Project would be recorded using industry-standard software (*e.g.,* Mysticetus or a similar software) installed on field laptops and/or tablets. Dominion Energy is required to submit weekly, monthly, annual, and situational reports. The specifics of what we require to be reported can be found in the regulatory text at the end of this final rule.

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

Monthly Report—Dominion Energy is required to compile and submit monthly reports to NMFS Office of Protected Resources that include a summary of all information in the weekly reports, including project activities carried out in the previous month, vessel transits (number, type of vessel, and route), number of piles installed, all detections of marine mammals, and any mitigative actions taken. Monthly reports would be due on the 15th of the month for the previous month. The monthly report would also identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is complete, monthly reports would no longer be required.

Annual Reporting—Dominion Energy is required to submit an annual marine mammal monitoring (both PSO and PAM) report to NMFS Office of Protected Resources no later than 90 days following the end of a given calendar year describing, in detail, all of the information required in the monitoring section above. A final annual report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report.

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

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

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

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

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

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

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

Adaptive Management

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

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

The use of adaptive management allows NMFS to consider new information and modify mitigation,

monitoring, or reporting requirements, as appropriate, with input from Dominion Energy regarding practicability, if such modifications will have a reasonable likelihood of more effectively accomplishing the goal of the measures. The following are some of the possible sources of new information to be considered through the adaptive management process: (1) results from monitoring reports, including the weekly, monthly, situational, and annual reports required; (2) results from marine mammal and sound research; and (3) any information which reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOA. During the course of the rule, Dominion Energy (and other LOA Holders conducting offshore wind development activities) are required to participate in one or more adaptive management meetings convened by NMFS and/or BOEM, in which the above information will be summarized and discussed in the context of potential changes to the mitigation or monitoring measures.

Negligible Impact Analysis and Determination

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

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

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

We base our analysis and negligible impact determination on the maximum number of takes that could occur and are authorized annually and across the effective period of these regulations and extensive qualitative consideration of other contextual factors that influence the degree of impact of the takes on the affected individuals and the number and context of the individuals affected. As stated before, the number of takes, both maximum annual and 5-year total, alone are only a part of the analysis.

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

Last, we provide a negligible impact determination for each species or stock, providing species or stock-specific information or analysis, where appropriate (*e.g.,* North Atlantic right whales given their population status). Organizing our analysis by grouping species or stocks that share common traits or that would respond similarly to effects of Dominion Energy's activities, and then providing species- or stock-specific information allows us to avoid duplication while ensuring that we have analyzed the effects of the specified activities on each affected species or stock. It is important to note that in the group or species sections, we base our negligible impact analysis on the maximum annual take that is predicted under the 5-year rule; however, the majority of the impacts are associated with WTG foundation and OSS foundation installation, which is scheduled to occur largely within the first 2 years (2024 through 2025) of the effective period of these regulations. The estimated take in the other years is expected to be notably less, which is reflected in the total take that would be allowable under the rule (see Tables 22, 23, and 24).

As described previously, no serious injury or mortality is anticipated or authorized in this rule. Any Level A harassment authorized would be in the form of auditory injury (*i.e.,* PTS). The number of takes by harassment Dominion Energy has requested and NMFS is authorizing is based on exposure models that consider the outputs of acoustic source and propagation models and other data such as frequency of occurrence or group sizes. Several conservative parameters and assumptions are ingrained into these models, such as assuming forcing functions that consider direct contact with piles (*i.e.,* no cushion allowances) and the broad application of an average seasonal sound speed profile (*i.e.,* between May 1st and October 31st) to all months within a given season based on the foundation pile driving period. The exposure model results do not reflect any mitigation measures (other

than 10 dB sound attenuation for foundation pile driving and spatio-temporal restrictions (*i.e.,* seasonal pile driving window; pile driving cannot start at night)) or avoidance response. The number of takes requested and authorized also reflects careful consideration of other data (*e.g.,* group size data) and for Level A harassment potential of some large whales, the consideration of mitigation measures. For all species, the number of takes authorized represents the maximum amount of Level A harassment and Level B harassment that could occur.

Behavioral Disturbance

In general, NMFS anticipates that impacts on an individual that has been harassed are likely to be more intense when exposed to higher received levels and for a longer duration (though this is in no way a strictly linear relationship for behavioral effects across species, individuals, or circumstances) and less severe impacts result when exposed to lower received levels and for a brief duration. However, there is also growing evidence of the importance of contextual factors such as distance from a source in predicting marine mammal behavioral response to sound—*i.e.,* sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter and Doukara, 2012; Falcone *et al.,* 2017). As described in the Potential Effects to Marine Mammals and their Habitat section of the proposed rule, the intensity and duration of any impact resulting from exposure to Dominion Energy's activities is dependent upon a number of contextual factors including, but not limited to, sound source frequencies, whether the sound source is moving towards the animal, hearing ranges of marine mammals, behavioral state at time of exposure, status of individual exposed (*e.g.,* reproductive status, age class, health) and an individual's experience with similar sound sources. Southall *et al.* (2021), Ellison *et al.* (2012) and Moore and Barlow (2013), among others, emphasize the importance of context (*e.g.,* behavioral state of the animals, distance from the sound source) in evaluating behavioral responses of marine mammals to acoustic sources. Harassment of marine mammals may result in behavioral modifications (*e.g.,* avoidance, temporary cessation of foraging or communicating, changes in respiration or group dynamics, masking) or may result in auditory impacts such as hearing loss. In addition, some of the lower-level physiological stress responses (*e.g.,* change in respiration, change in heart rate) discussed previously would likely co-occur with the behavioral modifications, although these physiological responses are more difficult to detect, and fewer data exist relating these responses to specific received levels of sound. Takes by Level B harassment, then, may have a stress-related physiological component as well; however, we would not expect Dominion Energy's activities to produce conditions of long-term and continuous exposure to noise leading to long-term physiological stress responses in marine mammals that could affect reproduction or survival.

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

Many species perform vital functions, such as feeding, resting, traveling, and socializing on a diel cycle (24-hour cycle). Behavioral reactions to noise exposure, when taking place in a biologically important context, such as disruption of critical life functions, displacement, or avoidance of important habitat, are more likely to be significant if they last more than 1 day or recur on subsequent days (Southall *et al.,* 2007) due to diel and lunar patterns in diving and foraging behaviors observed in many cetaceans (Baird *et al.,* 2008; Barlow *et al.,* 2020; Henderson *et al.,* 2016; Schorr *et al.,* 2014). It is important to note the water depth in the Project Area is shallow (up to 40 m) and deep diving species, such as sperm whales, are not expected to be engaging in deep foraging dives when exposed to noise above NMFS harassment thresholds during the specified activities. Therefore, we do not anticipate impacts to deep foraging behavior to be impacted by the specified activities.

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

For Dominion Energy, impact pile driving of foundation piles is most likely to result in a higher magnitude and severity of behavioral disturbance than other activities (*i.e.,* vibratory pile driving, HRG surveys). Impact pile driving has higher source levels and longer durations (on an annual basis) than vibratory pile driving and HRG surveys. HRG survey equipment also produces much higher frequencies than pile driving, resulting in minimal sound propagation and associated exposure. While impact pile driving for foundation installation is anticipated to be most impactful for these reasons, impacts are minimized, to the extent practicable, through implementation of mitigation measures, including use of a sound attenuation system, soft-starts, the implementation of clearance zones that would facilitate a delay to pile-driving commencement, and implementation of shutdown zones. For example, given sufficient notice through the use of soft-start, marine mammals are expected to move away from a sound source that is disturbing prior to becoming exposed to very loud noise levels. The requirement to couple visual monitoring and PAM before and during all foundation installation will increase the overall capability to detect marine mammals compared to one method alone.

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

Temporary Threshold Shift (TTS)

TTS is one form of Level B harassment that marine mammals may incur through exposure to Dominion Energy's activities and, as described earlier, the authorized takes by Level B harassment may represent takes in the form of behavioral disturbance, TTS, or both. As discussed in the Potential Effects of Specified Activities on Marine Mammals and their Habitat section of the proposed rule (88 FR 28656, May 4, 2023), in general, TTS can last from a few minutes to days, be of varying degree, and occur across different frequency bandwidths, all of which determine the severity of the impacts on the affected individual, which can range from minor to more severe. Impact and vibratory pile driving generate sounds in the lower frequency ranges (with most of the energy below 1–2 kHz but with a small amount energy ranging up to 20 kHz); therefore, in general and all else being equal, we anticipate the potential for TTS is higher in low-frequency cetaceans (*i.e.,* mysticetes) than other marine mammal hearing groups and is more likely to occur in frequency bands in which they communicate. Additionally, though the frequency range of TTS that marine mammals might sustain would overlap with some of the frequency ranges of their vocalizations, the frequency range of TTS from Dominion Energy's pile driving activities would not typically span the entire frequency range of one vocalization type, much less span all types of vocalizations or other critical auditory cues for any given species. The required mitigation measures further reduce the potential for TTS for all species.

Generally, both the degree of TTS and the duration of TTS would be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher, or the duration is longer). The threshold for the onset of TTS was discussed previously (see the Estimated Take section of this preamble). However, source level is not the sole predictor of TTS. An animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL, which would be difficult considering the required mitigation and the nominal speed of the receiving animal relative to the stationary sources such as impact pile driving. The recovery time of TTS is also of importance when considering the potential impacts from TTS. In TTS laboratory studies (as discussed in the Potential Effects of the Specified Activities on Marine Mammals and their Habitat section of the proposed rule (88 FR 28656, May 4, 2023)), some using exposures of almost an hour in duration or up to 217 SEL, almost all individuals recovered within 1 day (or less, often in minutes) and we note that while the pile-driving activities last for hours a day, it is unlikely that most marine mammals would stay in the close vicinity of the source long enough to incur more severe TTS. Overall, given the small number of times that any individual might incur TTS, the low degree of TTS and the short anticipated duration, and the unlikely scenario that any TTS overlapped the entirety of a critical hearing range, it is unlikely that TTS of the nature expected to result from the project's activities would result in behavioral changes or other impacts that would impact any individual's (of any hearing sensitivity) reproduction or survival.

Permanent Threshold Shift (PTS)

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

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

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

Auditory Masking or Communication Implications

The ultimate potential impacts of masking on an individual are similar to those discussed for TTS (*e.g.,* decreased ability to communicate, forage effectively, or detect predators), but an important difference is that masking only occurs during the time of the signal, versus TTS, which continues beyond the duration of the signal. Also, though, masking can result from the sum of exposure to multiple signals, none of which might individually cause TTS. Fundamentally, masking is referred to as a chronic effect because one of the key potential harmful components of masking is its duration—the fact that an animal would have reduced ability to hear or interpret critical cues becomes much more likely to cause a problem the longer it is

occurring. Inherent in the concept of masking is the fact that the potential for the effect is only present during the times that the animal and the source are in close enough proximity for the effect to occur and further, this time period would need to coincide with a time that the animal was utilizing sounds at the masked frequency.

As our analysis for this project has indicated, we expect that impact pile driving foundations have the greatest potential to mask marine mammal signals, and this pile driving may occur for several, albeit intermittent, hours per day, for multiple days per year. Masking is fundamentally more of a concern at lower frequencies (which are pile-driving dominant frequencies), because low frequency signals propagate significantly further than higher frequencies and because they are more likely to overlap both the narrower low frequency calls of mysticetes, as well as many non-communication cues related to fish and invertebrate prey, and geologic sounds that inform navigation. However, the area in which masking would occur for all marine mammal species and stocks (*e.g.,* predominantly in the vicinity of the foundation pile being driven) is small relative to the extent of habitat used by each species and stock. In summary, the nature of Dominion Energy's activities, paired with habitat use patterns by marine mammals, does not support the likelihood that the level of masking that could occur would have the potential to affect reproductive success or survival.

Impacts on Habitat and Prey

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

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

The presence of wind turbines within the Lease Area could have longer-term impacts on marine mammal habitat, as the project would result in the persistence of the structures within marine mammal habitat for more than 30 years. The presence of structures such as wind turbines is, in general, likely to result in certain oceanographic effects in the marine environment and may alter aggregations and distribution of marine mammal zooplankton prey through changing the strength of tidal currents and associated fronts, changes in stratification, primary production, the degree of mixing, and stratification in the water column (Chen *et al.,* 2021; Johnson *et al.,* 2021; Christiansen *et al.,* 2022; Dorrell *et al.,* 2022).

As discussed in the Potential Effects of the Specified Activities on Marine Mammals and their Habitat section of the proposed rule (88 FR 28656, May 4, 2023), the project would consist of no more than 179 foundations (176 WTGs and 3 OSSs) in the Lease Area, which will gradually become operational following construction completion. While there are likely to be oceanographic impacts from the presence of the CVOW–C Project, meaningful oceanographic impacts relative to stratification and mixing that would significantly affect marine mammal habitat and prey over large areas in key foraging habitats during the effective period of the regulations are not anticipated (which considers 2–3 years of turbine operation). For these reasons, if oceanographic features are affected by the project during the effective period of the regulations, the impact on marine mammal habitat and their prey is likely to be comparatively minor.

The CVOW–C Biological Opinion provided an evaluation of the presence and operation of the Project on, among other species, marine mammals and their prey (see *https://repository.library.noaa.gov/view/noaa/55495*). While the consultation considered the life of the project (approximately 33 years), we considered the potential for the habitat and prey impacts to occur within the 5-year effective time frame of this rule. Overall, the Biological Opinion concluded that impacts from loss of sandy bottom habitat (from the presence of turbines and placement of scour protection) as well as any beneficial reef effects are expected to be so small that they cannot be meaningfully measured, evaluated, or detected, and are therefore insignificant. The Biological Opinion also concluded that the presence and operation of the wind farm may change the distribution of plankton within the wind farm, but these changes are not expected to affect the oceanographic forces transporting zooplankton into the area. Therefore, the Biological Opinion concluded that the overall reduction in biomass of plankton is not an anticipated outcome of operating the Project. Thus, because changes in the biomass of zooplankton are not anticipated, any higher trophic level impacts are also not anticipated. That is, no effects to pelagic fish or benthic invertebrates that depend on plankton as forage food are expected to occur. Zooplankton, fish, and invertebrates are all considered marine mammal prey and, as fully described in the Biological Opinion, measurable, detectable, or significant changes to marine mammal prey abundance and distribution from wind farm operation are not anticipated.

Mitigation To Reduce Impacts on All Species

This rulemaking includes a variety of mitigation measures designed to minimize to the extent practicable impacts on all marine mammals, with a focus on North Atlantic right whales (the latter is described in more detail below). For the dual approach of vibratory and impact pile driving of foundation piles, ten overarching measures are required, which are intended to reduce both the number and intensity of marine mammal takes: (1) seasonal/time of day work restrictions; (2) use of multiple PSOs to visually observe for marine mammals (with any detection within specifically designated zones that would trigger a delay or shutdown); (3) use of PAM to acoustically detect marine mammals, with a focus on detecting baleen whales (with any detection within designated zones triggering delay or shutdown); (4) implementation of clearance zones; (5) implementation of shutdown zones; (6) use of soft-start; (7) use of noise attenuation technology (*i.e.,* double bubble curtain); (8) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Dominion Energy personnel must be reported to PSOs; (9) sound field verification monitoring; and (10) Vessel Strike Avoidance measures to reduce the risk of a collision with a marine mammal and vessel. For temporary cofferdam and goal post installation and removal, we are requiring five overarching measures: (1) seasonal/time of day work restrictions; (2) use of multiple PSOs to visually

observe for marine mammals (with any detection with specifically designated zones that would trigger a delay or shutdown); (3) implementation of clearance zones; (4) implementation of shutdown zones; and (5) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Dominion Energy personnel must be reported to PSOs. Lastly, for HRG surveys, we are requiring six measures: (1) measures specifically for Vessel Strike Avoidance; (2) specific requirements during daytime and nighttime HRG surveys; (3) implementation of clearance zones; (4) implementation of shutdown zones; (5) use of ramp-up of acoustic sources; and (6) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Dominion Energy personnel must be reported to PSOs.

NMFS prescribes mitigation measures based on the following rationale. For activities with large harassment isopleths, Dominion Energy is committed to reducing the noise levels generated to the lowest levels practicable and is required to ensure that they do not exceed a noise footprint above that which was modeled, assuming a 10-dB attenuation. Use of a soft-start during impact pile driving will allow animals to move away from (*i.e.,* avoid) the sound source prior to applying higher hammer energy levels needed to install the pile (Dominion Energy will not use a hammer energy greater than necessary to install piles). Similarly, ramp-up during HRG surveys would allow animals to move away and avoid the acoustic sources before they reach their maximum energy level. For all activities, clearance zone and shutdown zone implementation, which are required when marine mammals are within given distances associated with certain impact thresholds for all activities, will reduce the magnitude and severity of marine mammal take. Additionally, the use of multiple PSOs (WTG and OSS foundation installation, temporary cofferdam and goal post installation and removal, HRG surveys), PAM operators (for foundation installation), and maintaining awareness of marine mammal sightings reported in the region (WTG and OSS foundation installation, temporary cofferdam and goal post installation and removal, HRG surveys) will aid in detecting marine mammals that would trigger the implementation of the mitigation measures. The reporting requirements including SFV reporting (for foundation installation and foundation operation,), will assist NMFS in identifying if impacts beyond those analyzed in this final rule are occurring, potentially leading to the need to enact adaptive management measures in addition to or in place of the mitigation measures.

Mysticetes

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

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

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

The potential for repeated exposures is dependent upon the residency time of whales, with migratory animals unlikely to be exposed on repeated occasions and animals remaining in the area to be more likely exposed repeatedly. For mysticetes, where relatively low numbers of species-specific take by Level B harassment are predicted (compared to the abundance of each mysticete species or stock, such as is indicated in Table 23) and movement patterns suggest that individuals would not necessarily linger in a particular area for multiple days, each predicted take likely represents an exposure of a different individual; the behavioral impacts would, therefore, be expected to occur within a single day within a year—an amount that is not be expected to impact reproduction or survival. Species with longer residence time in the Project Area may be subject to repeated exposures across multiple days.

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

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

North Atlantic Right Whale

North Atlantic right whales are listed as endangered under the ESA, and the western Atlantic stock is considered depleted and strategic under the MMPA.

As described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule (88 FR 28656, May 4, 2023), North Atlantic right whales are threatened by a low population abundance, higher than average mortality rates, and lower than average reproductive rates. Recent studies have reported individuals showing high stress levels (*e.g.,* Corkeron *et al.,* 2017) and poor health, which has further implications on reproductive success and calf survival (Christiansen *et al.,* 2020; Stewart *et al.,* 2021; Stewart *et al.,* 2022). As described below, a UME has been designated for North Atlantic right whales. Given this, the status of the North Atlantic right whale population is of heightened concern and, therefore, merits additional analysis and consideration. No injury or mortality is anticipated or authorized for this species.

For North Atlantic right whales, this rule authorizes up to 17 takes, by Level B harassment only, over the 5-year period, with a maximum annual allowable take of 7 (equating to approximately 2.07 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.,* years when only HRG surveys would be occurring). The Project Area is known as a migratory corridor for North Atlantic right whales and given the nature of migratory behavior (*e.g.,* continuous path), as well as the low number of total takes, we anticipate that few, if any, of the instances of take would represent repeat takes of any individual, though it could occur if whales are engaged in opportunistic foraging behavior. While opportunistic foraging may occur in the Project area, the habitat does not support prime foraging habitat.

The Mid-Atlantic, including the Project Area, may be a stopover site for migrating North Atlantic right whales moving to or from southeastern calving grounds. Northward migration occurs mainly during the months of March and April while southern transit typically takes place during the months of November and December (LaBrecque *et al.,* 2015; Van Parijs *et al.,* 2015). Overall, the Project Area contains habitat less frequently utilized by North Atlantic right whales than the foraging and calving grounds. Salisbury *et al.* (2015) detected North Atlantic right whales year-round off the coast of Virginia, yet they were only detected on 10 percent of the days from May through October. The greatest detections occurred from October through December through March, outside of the months of Dominion Energy's planned foundation installation. Therefore, we anticipate that any individual whales would typically be migrating through the Project Area and would not be lingering for extended periods of time and, further, fewer would be present in the months when foundation installation would be occurring. Other activities planned by Dominion Energy involve either much smaller harassment zones (*i.e.,* HRG surveys) or are limited in amount and nearshore in location (*i.e.,* cable landfall construction) but may occur during periods when North Atlantic right whales are more likely to be migrating through the Project Area. As any North Atlantic right whales within the Project Area would likely be engaged in migratory behavior (LaBrecque *et al.,* 2015), it is likely that the authorized instances of take would occur to separate individual whales; however, some may be repeat takes of the same animal across multiple days for some short period of time. The only activity occurring from December through May that may impact North Atlantic right whale would be HRG surveys; no take from cable landfall construction is anticipated or authorized. Across all years, while it is possible an animal could have been exposed during a previous year, the low number of takes authorized during the 5-year effective period of the final rulemaking makes this scenario possible but unlikely (n=17). However, if an individual were to be exposed during a subsequent year, the impact of that exposure is likely independent of the previous exposure given the duration between exposures.

North Atlantic right whales utilize areas outside of the Project Area for their main feeding, breeding, and calving activities. In general, North Atlantic right whales in the Project Area are expected to be engaging in migratory behavior. Given the species' migratory behavior in the Project Area, we anticipate individual whales would be typically migrating through the area during most months when foundation installation would occur (given the seasonal restrictions on foundation installation, rather than lingering for extended periods of time). Other work that involves either much smaller harassment zones (*e.g.,* HRG surveys) or is limited in amount (*e.g.,* cable landfall construction) may also occur during periods when North Atlantic right whales are using the habitat for migration. It is important to note the activities occurring from November through May that may impact North Atlantic right whale would be primarily HRG surveys, which would not result in very high received levels. Across all years, if an individual were to be exposed during a subsequent year, the impact of that exposure is likely independent of the previous exposure given the duration between exposures.

As described in the Description of Marine Mammals in the Specified Geographic Region section, North Atlantic right whales are presently experiencing an ongoing UME (beginning in June 2017). Preliminary findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of North Atlantic right whales. Given the current status of the North Atlantic right whale, the loss of even one individual could significantly impact the population. No mortality, serious injury, or injury of North Atlantic right whales as a result of the project is expected or authorized. Any disturbance to North Atlantic right whales due to Dominion Energy's activities is expected to result in temporary avoidance of the immediate area of construction. As no injury, serious injury, or mortality is expected or authorized, and Level B harassment of North Atlantic right whales will be reduced to the level of least practicable adverse impact through use of mitigation measures, the authorized number of takes of North Atlantic right whales would not exacerbate or compound the effects of the ongoing UME.

As described in the general *Mysticetes* section above, foundation installation is likely to result in the highest number of annual takes and is of greatest concern given loud source levels. This activity is expected to consist of approximately 213 days over a maximum of 2 years, assuming up to 30 days necessary for all 3 OSS foundations to be installed and assuming that a single WTG monopile (n=176 WTG foundations) is installed per day (*i.e.,* 24-hour period), which we do acknowledge is not the case as Dominion Energy would, on some days, install up to 2 WTG monopile foundations, which would reduce this overall estimate. We also acknowledge that this estimate represents 183 pile driving events, not WTGs planned to be installed, which slightly overestimates the total number of pile driving days likely necessary. In all cases, these activities would only occur during times when, based on the best available scientific data, North Atlantic right whales are less frequently encountered due to their migratory behavior. The potential types, severity, and magnitude of impacts are also anticipated to mirror that described in the general *Mysticetes*

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

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

Although acoustic masking may occur in the vicinity of the foundation installation activities, based on the acoustic characteristics of noise associated with pile driving (*e.g.,* frequency spectra, short duration of exposure) and construction surveys (*e.g.,* intermittent signals), NMFS expects masking effects to be minimal (*e.g.,* impact pile driving) to none (*e.g.,* HRG surveys). In addition, masking would likely only occur during the period of time that a North Atlantic right whale is in the relatively close vicinity of pile driving, which would be rare, given pile driving is intermittent within a day and confined to the months in which North Atlantic right whales are at lower densities and primarily moving through the area, the anticipated mitigation effectiveness, and the likely avoidance behaviors. TTS is another potential form of Level B harassment that could result in brief periods of slightly reduced hearing sensitivity affecting behavioral patterns by making it more difficult to hear or interpret acoustic cues within the frequency range (and slightly above) of sound produced during impact pile driving; however, any TTS would likely be of low amount, limited duration, and limited to frequencies where most construction noise is centered (below 2 kHz). NMFS expects that right whale hearing sensitivity would return to pre-exposure levels shortly after migrating through the area or moving away from the sound source.

As described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule (88 FR 28656, May 4, 2023), the distance of the receiver to the source influences the severity of response with greater distances typically eliciting less severe responses. NMFS recognizes North Atlantic right whales migrating could be pregnant females (in the fall) and cows with older calves (in spring) and that these animals may slightly alter their migration course in response to any foundation pile driving; however, as described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule (88 FR 28656, May 4, 2023), we anticipate that course diversion would be of small magnitude. Hence, while some avoidance of the pile-driving activities may occur, we anticipate any avoidance behavior of migratory North Atlantic right whales would be similar to that of gray whales (Tyack *et al.,* 1983), on the order of hundreds of meters up to 1 to 2 km. This diversion from a migratory path otherwise uninterrupted by the project's activities is not expected to result in meaningful energetic costs that would impact annual rates of recruitment of survival. NMFS expects that North Atlantic right whales would be able to avoid areas during periods of active noise production while not being forced out of this portion of their habitat.

North Atlantic right whale presence in the Project Area is year-round. However, abundance during summer months is lower compared to the winter months with spring and fall serving as ''shoulder seasons'' wherein abundance waxes (fall) or wanes (spring). Given this year-round habitat usage, in recognition that where and when whales may actually occur during project activities is unknown as it depends on the annual migratory behaviors, NMFS is requiring a suite of mitigation measures designed to reduce impacts to North Atlantic right whales to the maximum extent practicable. These mitigation measures (*e.g.,* seasonal/daily work restrictions, vessel separation distances, reduced vessel speed) would not only avoid the likelihood of vessel strikes but also would minimize the severity of behavioral disruptions by minimizing impacts (*e.g.,* through sound reduction using attenuation systems and reduced spatio-temporal overlap of project activities and North Atlantic right whales). This would further ensure that the number of takes by Level B harassment that are estimated to occur are not expected to affect reproductive success or survivorship by detrimental impacts to energy intake or cow/calf interactions during migratory transit. However, even in consideration of recent habitat-use and distribution shifts, Dominion Energy would still be installing foundations when the presence of North Atlantic right whales is expected to be lower.

As described in the Description of Marine Mammals in the Specified Geographic Region section, Dominion Energy would be constructed within the North Atlantic right whale migratory corridor BIA, which represent areas and months within which a substantial portion of a species or population is known to migrate. The Lease Area is relatively small compared with the migratory BIA area (approximately 456.5 km^2 for OCS–A 0483 versus the size of the full North Atlantic right whale migratory BIA, 269,448 km^2). Further, the BIA is approximately 177 km (110 mi) in width (west to east), when measured at the widest point beginning just off the Virginia coastline. The Lease Area begins approximately 44 km (27.3 mi) east of Virginia Beach, Virginia, and is approximately 25 km (15.5 mi) in width from east to west (when measured horizontally). While construction activities would be occurring within the migratory path, its placement in deeper waters no closer than 44 km offshore and the fact the foundation installation (the most impactful activity) would not be occurring during the migration period (*i.e.,* no foundation installation would occur November 1st through April 30th) provide high conservation benefits. Overall North Atlantic right whale migration is not expected to be impacted by the planned activities. There are no known North Atlantic right whale feeding, breeding, or calving areas within the Project Area. Prey species are mobile (*e.g.,* calanoid copepods can initiate rapid and directed escape responses) and are broadly distributed throughout the Project Area (noting again that North Atlantic right whale prey is not particularly concentrated in the Project Area relative

to nearby habitats). Therefore, any impacts to prey that may occur are also unlikely to impact marine mammals.

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

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

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

Additionally, Dominion Energy anticipates a need to undertake a dual vibratory and impact pile driving approach for foundation piles to avoid risks associated with pile run due to softer sedimentation in the Project Area. While Dominion Energy expects that up to 70 percent of their piles may necessitate this joint approach (approximately 123 foundation piles), realistically not all piles would be at risk of pile run and would be installed, instead, by impact pile driving alone. However, as a conservative approach given uncertainty with the seabed conditions for the location of each pile, Dominion Energy assumed all foundation piles would undertake this approach. Furthermore, Dominion Energy has already stated that no concurrent installation of foundation piles is planned to occur, no concurrent vibratory and impact driving is expected to occur either as a 1.2-hour gap between the end vibratory driving to the start of impact pile driving (to allow for the moving and set-up of equipment) would treat each installation approach as a separate event and would not overlap.

Finally, for HRG surveys, the maximum distance to the Level B harassment threshold is 100 m. The estimated take, by Level B harassment only, associated with HRG surveys conservatively accounts for the maximum number of North Atlantic right whale exposures that may occur when HRG acoustic sources are active. However, because of the short maximum distance to the Level B harassment threshold isopleth (100 m via the GeoMarine Dual 400 Sparker 800 J), the requirement that vessels maintain a distance of 500 m from any North Atlantic right whales, the fact that whales are unlikely to remain in close proximity to an HRG survey vessel for any length of time, and that the acoustic source would be shut down if a North Atlantic right whale is observed within 500 m of the source, any exposure to noise levels above the harassment threshold (if any) would be very brief. To further minimize exposures, ramp-up of boomers, sparkers, and CHIRPs (if applicable) must be delayed during the clearance period if PSOs detect a North Atlantic right whale (or any other ESA-listed species) within 500 m of the acoustic source. With implementation of the mitigation requirements, take by Level A harassment is not anticipated and, therefore, not authorized. Potential impacts associated with Level B harassment would include low-level, temporary behavioral modifications, most likely in the form of avoidance behavior. Given the high level of precautions taken to minimize both the number and intensity of Level B harassment on North Atlantic right whales, it is unlikely that the anticipated low-level exposures would lead to reduced reproductive success or survival.

As described above, no serious injury or mortality, or Level A harassment, of North Atlantic right whale is anticipated or authorized. Extensive North Atlantic right whale-specific mitigation measures (beyond the robust suite required for all species) are expected to further minimize the number and severity of takes by Level B harassment. Given the documented habitat use within the area, the majority of the individuals predicted taken (including no more than 17 instances of take, by Level B harassment only, over the course of the 5-year rule, with an annual maximum of no more than 7) would be impacted on a maximum of 2 days in a year as North Atlantic right whales utilize this area for migration and would be transiting rather than residing in the area for extended periods of time; and, further, any impacts to North Atlantic right whales are expected to be in the form of lower-level behavioral disturbance. Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, Dominion

Energy's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by Level B harassment anticipated and authorized would have a negligible impact on the North Atlantic right whale stock.

Fin Whale

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

The rule authorizes up to 215 takes, by harassment only, over the 5-year effective period of the rule. The maximum annual allowable take by Level A harassment and Level B harassment, would be 4 and 113, respectively (combined, this annual take (n=117) equates to approximately 1.72 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.,* years when only HRG surveys would be occurring). The Project Area does not overlap with any known areas of specific biological importance to fin whales. It is likely that some subset of the individual whales exposed could be taken several times annually.

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

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

Given the documented habitat use within the area, some of the individuals taken would likely be exposed on multiple days. However, as described the Project Area does not include areas where fin whales are known to concentrate for feeding or reproductive behaviors and the predicted takes are expected to be in the form of lower-level impacts. Given the magnitude and severity of the impacts discussed above (including no more than 215 takes by harassment only over the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 4 and 113, respectively), and in consideration of the required mitigation and other information presented, Dominion Energy's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and authorized will have a negligible impact on the western North Atlantic stock of fin whales.

Humpback Whale

The West Indies DPS of humpback whales is not listed as threatened or endangered under the ESA, but the Gulf of Maine stock, which includes individuals from the West Indies DPS, is considered Strategic under the MMPA. However, as described in the Description of Marine Mammals in the Specified Geographic Region section of this preamble, humpback whales along the Atlantic Coast have been experiencing an active UME as elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately 40 percent had evidence of human interaction (vessel strike or entanglement). The UME does not yet provide cause for concern regarding population-level impacts and take from vessel strike and entanglement is not authorized in this rulemaking. Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or DPS of which the Gulf of Maine stock is a part) remains stable at approximately 12,000 individuals.

The rule authorizes up to 250 takes by harassment only over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, is four and 130, respectively (combined, this maximum annual take (n=134) equates to approximately 9.6 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.,* years when only HRG surveys would be occurring). Given that humpback whales are known to forage off of Virginia, it is likely that some subset of the individual whales exposed could be taken several times annually.

Among the activities analyzed, pile driving is likely to result in the highest number of Level A harassment annual takes (four) of humpback whales. The maximum number of annual take authorized, by Level B harassment, is highest for pile driving (n=104; WTGs plus OSS pin piles).

As described in the Description of Marine Mammals in the Specified Geographic Region section, Humpback whales are known to occur regularly throughout the Mid-Atlantic Bight, including Virginia waters, with strong seasonality where peak occurrences occur April to June (Barco *et al.,* 2002; Geo-Marine, 2010; Curtice *et al.,* 2019; Hayes *et al.,* 2022).

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

Assuming humpback whales who are feeding in waters within or surrounding the Project Area behave similarly, we expect that the predicted instances of disturbance could be comprised of some individuals that may be exposed on multiple days if they are utilizing the area as foraging habitat. Also similar to other baleen whales, if migrating, such individuals would likely be exposed to

noise levels from the project above the harassment thresholds only once during migration through the Project Area.

For all the reasons described in the *Mysticetes* section above, we anticipate any potential PTS and TTS would be concentrated at half or one octave above the frequency band of pile-driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of baleen whales. If TTS is incurred, hearing sensitivity would likely return to pre-exposure levels relatively shortly after exposure ends. Any masking or physiological responses would also be of low magnitude and severity for reasons described above.

Given the magnitude and severity of the impacts discussed above (including no more than 250 takes over the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of four and 130, respectively), and in consideration of the required mitigation measures and other information presented, Dominion Energy's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and authorized will have a negligible impact on the Gulf of Maine stock of humpback whales.

Minke Whale

Minke whales are not listed under the ESA, and the Canadian East Coast stock is neither considered Depleted nor strategic under the MMPA. There are no known areas of specific biological importance in or adjacent to the Project Area. As described in the Description of Marine Mammals in the Specified Geographic Region section, a UME has been designated for this species but is pending closure. No serious injury or mortality is anticipated or authorized for this species.

The rule authorizes up to 131 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, would be eight and 56, respectively (combined, this annual take (n=64) equates to approximately 0.29 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.,* years when only HRG surveys would be occurring). As described in the Description of Marine Mammals in the Specified Geographic Region section of the proposed rule, minke whales are common offshore the U.S. Eastern Seaboard with a strong seasonal component in the continental shelf and in deeper, off-shelf waters (CETAP, 1982; Hayes *et al.,* 2022). In the Project area, minke whales are predominantly migratory and their known feeding areas are north, including a feeding BIA in the southwestern Gulf of Maine and George's Bank. Therefore, they would be more likely to be moving through (with each take representing a separate individual), though it is possible that some subset of the individual whales exposed could be taken up to a few times annually.

As described in the Description of Marine Mammals in the Specified Geographic Region section, there is a UME for Minke whales, along the Atlantic coast from Maine through South Carolina, with highest number of deaths in Massachusetts, Maine, and New York, and preliminary findings in several of the whales have shown evidence of human interactions or infectious diseases. However, we note that the population abundance is greater than 21,000 and the take authorized through this action is not expected to exacerbate the UME in any way. Furthermore, this UME has been declared non-active and is pending closure.

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

Given the magnitude and severity of the impacts discussed above (including no more than 131 takes of the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 8 and 56, respectively), and in consideration of the required mitigation and other information presented, Dominion Energy's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and authorized will have a negligible impact on the Canadian Eastern Coastal stock of minke whales.

Sei Whale

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

The rule authorizes up to 10 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, would be one and three, respectively (combined, this annual take (n=4) equates to approximately 0.06 percent of the stock abundance if each take were considered to be of a different individual). As described in the Description of Marine Mammals in the Area of Specified Activities section of the proposed rule, most of the sei whale distribution is concentrated in Canadian waters and seasonally in northerly U.S. waters, though they are uncommonly observed in the waters off of Virginia. Because sei whales are migratory and their known feeding areas are east and north of the Project Area (*e.g.,* there is a feeding BIA in the Gulf of Maine), they would be more likely to be moving through and, considering this and the very low number of total takes, it is unlikely that any individual would be exposed more than once within a given year.

With respect to the severity of those individual takes by behavioral Level B harassment, we would anticipate impacts to be limited to low-level, temporary behavioral responses with avoidance and potential masking impacts in the vicinity of the turbine installation to be the most likely type of response. Any potential PTS and TTS would likely be concentrated at half or one octave above the frequency band of pile-driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of sei whales. Moreover, any TTS would be of a small degree. Any avoidance of the Project Area due to the Project's activities would be expected to be temporary.

Given the magnitude and severity of the impacts discussed above (including no more than ten takes of the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of one and three, respectively), and in consideration of the required mitigation and other information presented, Dominion Energy's activities are not expected to result in impacts on the reproduction or survival of any

individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and authorized will have a negligible impact on the Nova Scotia stock of sei whales.

Odontocetes

In this section, we include information here that applies to all of the odontocete species and stocks addressed below. Odontocetes include dolphins, porpoises, and all other whales possessing teeth, and we further divide them into the following subsections: sperm whales, dolphins and small whales, and harbor porpoises. These sub-sections include more specific information, as well as conclusions for each stock represented.

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

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

Any masking or TTS effects are anticipated to be of low-severity. First, the frequency range of pile driving, the most impactful activity to be conducted in terms of response severity, falls within a portion of the frequency range of most odontocete vocalizations. However, odontocete vocalizations span a much wider range than the low frequency construction activities planned for the project. As described above, recent studies suggest odontocetes have a mechanism to self-mitigate (*i.e.,* reduce hearing sensitivity) the impacts of noise exposure, which could potentially reduce TTS impacts. Any masking or TTS is anticipated to be limited and would typically only interfere with communication within a portion of an odontocete's range and as discussed earlier, the effects would only be expected to be of a short duration and, for TTS, a relatively small degree.

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

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

Sperm Whale

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

The rule authorizes up to six takes, by Level B harassment only over the 5-year period. The maximum annual allowable take by Level B harassment, is three, which equates to approximately 0.07 percent of the stock abundance, if each take were considered to be of a different individual, with no take expected in the years without foundation installation (*e.g.,* years when only HRG surveys would be occurring). Given sperm whale's preference for deeper waters, especially for feeding, it is unlikely that individuals will remain in the Project Area for multiple days, and therefore, the estimated takes likely represent exposures of different individuals on 1 day annually.

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

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

Dolphins and Small Whales (Inclusive of Delphinid Species, False Killer Whale, Melon-headed Whale, Pygmy Sperm Whale, and Pilot Whales)

The 12 species and 13 stocks included in this group (which are indicated in Table 2 in the *Kogiidae* and *Delphinidae* families) are not listed under the ESA; however, the Southern Migratory Coastal stock of bottlenose dolphins and short-finned pilot whales are listed as Strategic under the MMPA, and pantropical spotted dolphins are listed as Depleted under the MMPA. There are no known areas of specific biological importance in or around the Project Area. As described above for any of these species and no UMEs have been designated for any of these species. No serious injury or mortality is anticipated or authorized for these species.

The 11 delphinid species (constituting 12 stocks) with takes authorized for the Project are Atlantic spotted dolphin, Atlantic white-sided dolphin, bottlenose dolphin, Clymene dolphin, common dolphin, false killer whale, melon-headed whale, long-finned pilot whale, short-finned pilot whale, pantropical spotted dolphin, and Risso's dolphin. The rule would allow for the total authorization of 8 to 26,764 takes (depending on species) by Level B harassment only, over the 5-year period. The maximum annual allowable take for these species by Level B harassment, would range from 4 (false killer whale) to 7,360 (both Atlantic spotted dolphin and common dolphin). Overall, this annual take equates to approximately 0.04 (Atlantic white-sided dolphin) to 18.44 (Atlantic spotted dolphin) percent of the stock abundance (if each take were considered to be of a different individual, which is not likely the case) depending on the species, with far lower numbers than that expected in the years without foundation installation (*e.g.,* years when only HRG surveys would be occurring).

Take has also been authorized for a single species (of a single stock) of Family *Kogiidae,* the pygmy sperm whale. This rule allows for the total authorization of two takes by Level B harassment only, over the entire 5-year period. The maximum annual allowable take for this species, by Level B harassment only, is one per year. Relative to the total population estimate for this small whale species, this equates to approximately 0.01 percent of the stock abundance, if each of the takes were considered to be of a different individual.

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

Across these species, the maximum number of incidental takes, by Level B harassment only, authorized in any one year ranges between 1 (pygmy sperm whale) and 7,360 (for both Atlantic spotted dolphins and common dolphins). The number of takes authorized in the last 3 years of the rule is notably less and the 5-year total number of take (by Level B harassment only) authorized ranges between 2 (pygmy sperm whale) and 26,764 (Atlantic spotted dolphin). Further, though the estimated numbers of take are comparatively higher than the numbers for mysticetes, we note that for all species they are relatively low relative to the population abundance.

For the Atlantic spotted dolphin, given both the comparatively higher number of takes and the higher number of takes relative to the stock abundance, while some of the takes likely represent exposures of different individuals on 1 day a year, it is likely that some subset of the individuals exposed could be taken several times annually. For all three stocks of bottlenose dolphin (*i.e.,* offshore, coastal, and joint-offshore and coastal), given the number of takes and residential tendencies of the species, while many of the takes likely represent exposures of different individuals on 1 day a year, some subset of the individuals exposed could be taken up to a few times annually.

As described above for odontocetes broadly, given the comparatively higher number of estimated takes for some species and the behavioral patterns of odontocetes, we anticipate that a fair number of these instances of take in a day represent multiple exposures of a smaller number of individuals, meaning the actual number of individuals taken is lower. Although some amount of repeated exposure to some individuals is likely given the duration of activity planned by Dominion Energy, the intensity of any Level B harassment combined with the availability of alternate nearby foraging habitat suggests that the likely impacts would not impact the reproduction or survival of any individuals.

Overall, most of the populations of all delphinid and small whale species and stocks for which we authorize take are stable (no declining population trends). For others, two stocks are labeled as strategic (*i.e.,* Southern Migratory Coastal stock of bottlenose dolphins and Western North Atlantic stock of short-finned pilot whale) and one is labeled as depleted (*i.e.,* pantropical spotted dolphin). None of these stocks are experiencing existing UMEs. No mortality, serious injury or Level A harassment is anticipated or authorized for any of these species. Given the magnitude and severity of the impacts discussed above and in consideration of the required mitigation and other information presented, as well as the status of these stocks, Dominion Energy's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take by harassment anticipated and authorized will have a negligible impact on all of the following species and stocks: pygmy sperm whales, Atlantic spotted dolphins, Atlantic white-sided dolphins, bottlenose dolphins, Clymene dolphins, common dolphins, false killer whales, melon-headed whales, pilot whale *spp.* (consisting of long-fined pilot whales and short-finned pilot whales), pantropical spotted dolphins, and Risso's dolphins.

Harbor Porpoises

Harbor porpoises are not listed under the ESA, and the Gulf of Maine/Bay of Fundy stock is neither considered depleted or strategic under the MMPA. The stock is found predominantly in northern U.S. coastal waters (less than 150 m depth) and up into Canada's Bay of Fundy (between New Brunswick and Nova Scotia). Although the population trend is not known, there are no UMEs or other factors that cause particular concern for this stock. No mortality or non-auditory injury are anticipated or authorized for this stock.

The rule authorizes up to 143 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, would be 1 and 40, respectively (combined, this annual take (n=41) equates to approximately 0.04 percent of the stock abundance if each take were considered to be of a different individual). Given the number of takes, while many of the takes likely represent exposures of different individuals on 1 day a year, some subset of the

individuals exposed could be taken up to a few times annually.

Regarding the severity of takes by Level B harassment, because harbor porpoises are particularly sensitive to noise, it is likely that a fair number of the responses could be of a moderate nature, particularly to pile driving. In response to pile driving, harbor porpoises are likely to avoid the area during construction, as previously demonstrated in Tougaard *et al.* (2009) in Denmark, in Dahne *et al.* (2013) in Germany, and in Vallejo *et al.* (2017) in the United Kingdom, although a study by Graham *et al.* (2019) may indicate that the avoidance distance could decrease over time. However, foundation installation is scheduled to occur off the coast of Virginia (based on the density values (0.00000) presented for both summer (June to August) and fall (September to October); Table 1) and, given alternative foraging areas, any avoidance of the area by individuals is not likely to impact the reproduction or survival of any individuals.

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

As discussed in Hayes *et al.* (2022), harbor porpoises are seasonally distributed. During fall (October through December) and spring (April through June), harbor porpoises are widely dispersed from New Jersey to Maine, with lower densities farther north and south. During winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina, and lower densities are found in waters off New York to New Brunswick, Canada. In non-summer months they have been seen from the coastline to deep waters (<1,800 m; Westgate *et al.,* 1998), although the majority are found over the continental shelf. While harbor porpoises are likely to avoid the area during any of the Project's construction activities, as demonstrated during European wind farm construction, the time of year in which work would occur is when harbor porpoises are not in highest abundance, and any work that does occur would not result in the species' abandonment of the waters off of Virginia.

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

Phocids (Harbor Seals and Gray Seals)

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

For the 2 seal species, the rule authorizes up to 220 takes for each species by harassment only over the 5-year period. The maximum annual allowable take for each species by Level A harassment and Level B harassment, would be one and 83, respectively (combined, this annual take (n=84) equates to approximately 0.14 percent of the stock abundance for harbor seals and 0.31 percent of the stock abundance for gray seals, if each take were considered to be of a different individual). Though harbor seals and gray seals are considered migratory and no specific feeding areas have been designated in the area, the higher number of takes relative to the stock abundance suggests that while some of the takes likely represent exposures of different individuals on 1 day a year, it is likely that some subset of the individuals exposed could be taken several times annually.

Harbor and gray seals occur in Virginia waters most often during the fall and winter, sometimes until early spring, with harbor seal occurrences more common than gray seals (Hayes *et al.,* 2022; Jones and Rees, 2022; Ampela *et al.,* 2023). Seals are more likely to be close to shore (*e.g.,* closer to the edge of the area ensonified above NMFS' harassment threshold), such that exposure to foundation installation would be expected to be at comparatively lower levels. There are no known haul-out sites or other areas of importance for either harbor or gray seals near the coastal cofferdam and goal post location (offshore of the State Military Reservation in Virginia Beach, Virginia) or in the Project Area. However, pinnipeds have been recorded at different sites in the Chesapeake Bay and along Eastern Shore, Virginia (Jones and Rees, 2022; Ampela *et al.,* 2023). Given the distance for which we expect Dominion Energy's activities to occur, away from the mouth and in-water regions of the Chesapeake Bay, NMFS does not expect that in-air sounds produced would cause the take of hauled-out pinnipeds. Therefore, NMFS does not expect any harassment to occur and has not authorized any take from in-air impacts on hauled-out seals.

As described in the Potential Effects to Marine Mammals and Their Habitat section in the proposed rule (88 FR 28656, May 4, 2023), construction of wind farms in Europe resulted in pinnipeds temporarily avoiding construction areas but returning within short time frames after construction was complete (Carroll *et al.,* 2010; Hamre *et al.,* 2011; Hastie *et al.,* 2015; Russell *et al.,* 2016; Brasseur *et al.,* 2010). Effects on pinnipeds that are taken by Level B harassment in the Project Area would likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals would simply move away from the sound source and be temporarily displaced from those areas (see Lucke *et al.,* 2006; Edren *et al.,* 2010; Skeate *et al.,* 2012; Russell *et al.,* 2016).

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

As described above, noise from pile driving is mainly low frequency and, while any PTS and TTS that does occur would fall within the lower end of pinniped hearing ranges (50 Hz to 86 kHz), PTS and TTS would not occur at frequencies around 5 kHz where

pinniped hearing is most susceptible to noise-induced hearing loss (Kastelein *et al.,* 2018). In summary, any PTS and TTS would be of small degree and not occur across the entire, or even most sensitive, hearing range. Hence, any impacts from PTS and TTS are likely to be of low severity and not interfere with behaviors critical to reproduction or survival.

Elevated numbers of harbor seal and gray seal mortalities were first observed in July 2018 and occurred across Maine, New Hampshire, and Massachusetts until 2020. Based on tests conducted so far, the main pathogen found in the seals belonging to that UME was phocine distemper virus, although additional testing to identify other factors that may be involved in this UME are underway. Currently, the only active UME is occurring in Maine with some harbor and gray seals testing positive for highly pathogenic avian in*f*luenza (HPAI) H5N1. Although elevated strandings continue, neither UME (alone or in combination) provides cause for concern regarding population-level impacts to any of these stocks. For harbor seals, the population abundance is over 61,000 and annual mortality/serious injury (M/SI) (n=339) is well below PBR (1,729) (Hayes *et al.,* 2020). The population abundance for gray seals in the United States is over 27,000, with an estimated overall abundance, including seals in Canada, of approximately 450,000. In addition, the abundance of gray seals is likely increasing in the U.S. Atlantic, as well as in Canada (Hayes *et al.,* 2020).

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

Negligible Impact Determination

No mortality or serious injury is anticipated to occur or authorized. As described in the analysis above, the impacts resulting from the project's activities cannot be reasonably expected to, and are not reasonably likely to, adversely affect any of the species or stocks through effects on annual rates of recruitment or survival. 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 required mitigation and monitoring measures, NMFS finds that the marine mammal take from all of Dominion Energy's specified activities combined 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 maximum number of individuals estimated to be taken in a year to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is less than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

NMFS is authorizing incidental take by Level A harassment and/or Level B harassment of 21 species of marine mammals (with 22 managed stocks). The maximum number of instances of takes by combined Level A harassment and Level B harassment possible within any 1 year relative to the best available population abundance is less than one-third for all species and stocks potentially impacted.

For 13 stocks, less than 1 percent of the stock abundance is authorized to be annually taken by harassment; for 7 stocks, less than 10 percent of the stock abundance is authorized to be taken annually by harassment; and for 1 stock, less than 20 percent of the stock abundance is authorized to be annually take by harassment. Specific to the North Atlantic right whale, the maximum amount of take, which is by Level B harassment only, is 7, or 2.07 percent of the stock abundance, assuming that each instance of take represents a different individual. While no population estimate is available for melon-headed whales, it can be assumed that the low amount of maximum annual take authorized (n=5; by Level B harassment only) would constitute small numbers. For all species, please see Table 24 for information relating to this small numbers analysis.

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

Unmitigable Adverse Impact Analysis and Determination

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

Classification

Endangered Species Act (ESA)

Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq.*) requires that each Federal agency ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the promulgation of rulemakings, NMFS consults internally whenever we propose to authorize take for endangered or threatened species, in this case with the NOAA GARFO.

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

NMFS issued a Biological Opinion on September 19, 2023 concluding that the promulgation of the rule and issuance of LOAs thereunder is not likely to jeopardize the continued existence of threatened and endangered species under NMFS' jurisdiction and is not likely to result in the destruction or adverse modification of designated or proposed critical habitat. The Biological Opinion is available at *https://repository.library.noaa.gov/view/noaa/55495*.

Dominion Energy is required to abide by the promulgated regulations, as well as the reasonable and prudent measures and terms and conditions of the

Biological Opinion and Incidental Take Statement, as issued by NMFS.

National Environmental Policy Act (NEPA)

To comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order 216–6A, NMFS must evaluate our proposed action (*i.e.,* promulgation of regulation) and alternatives with respect to potential impacts on the human environment. NMFS participated as a cooperating agency on the BOEM final Environmental Impact Statement (FEIS) for the CVOW–C Project offshore Virginia (2023 CVOW–C FEIS), which was finalized on September 29, 2023, and is available at *https://www.boem.gov/renewable-energy/state-activities/coastal-virginia-offshore-wind-commercial-project-final*. In accordance with 40 CFR 1506.3, NMFS independently reviewed and evaluated the 2023 CVOW–C FEIS and determined that it is adequate and sufficient to meet our responsibilities under NEPA for the promulgation of this rule and issuance of the associated LOA. NMFS, therefore, has adopted the 2023 CVOW–C FEIS through a joint Record of Decision (ROD) with BOEM. The joint ROD for adoption of the 2023 CVOW–C FEIS and promulgation of this final rule and subsequent issuance of a LOA can be found at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*.

Executive Order 12866

The Office of Management and Budget has determined that this rule is not significant for purposes of Executive Order 12866.

Regulatory Flexibility Act

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

Paperwork Reduction Act

Notwithstanding any other provision of law, no person is required to respond to, nor shall a person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid Office of Management and Budget (OMB) control number. These requirements have been approved by OMB under control number 0648–0151 and include applications for regulations, subsequent LOA, and reports. Send comments regarding any aspect of this data collection, including suggestions for reducing the burden, to NMFS.

Coastal Zone Management Act (CZMA)

The Coastal Zone Management Act requires that any applicant for a required Federal license or permit to conduct an activity, within the coastal zone or within the geographic location descriptions (*i.e.,* areas outside the coastal zone in which an activity would have reasonably foreseeable coastal effects), affecting any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. NMFS determined that Dominion Energy's application for an incidental take regulations is an unlisted activity and, thus, is not subject to Federal consistency requirements in the absence of the receipt and prior approval of an unlisted activity review request from the state by the Director of NOAA's Office for Coastal Management. Pursuant to 15 CFR 930.54, NMFS published notice of receipt of Dominion Energy's application in the **Federal Register** on September 15, 2022 (87 FR 56634) and published notice of the proposed rule on May 4, 2023 (88 FR 28656). The Commonwealth of Virginia did not request approval from the Director of NOAA's Office for Coastal Management to review Dominion Energy's application as an unlisted activity, and the time period for making such request has expired. Therefore, NMFS has determined the incidental take authorization is not subject to Federal consistency review.

Waiver of Delay in Effective Date

The Assistant Administrator for Fisheries has determined that there is a sufficient basis under the Administrative Procedure Act (APA) to waive the 30-day delay in the effective date of the measures contained in the final rule. Section 553 of the APA provides that the required publication or service of a substantive rule shall be made not less than 30 days before its effective date with certain exceptions, including (1) for a substantive rule that relieves a restriction or (2) when the agency finds and provides good cause for foregoing delayed effectiveness (5 U.S.C 553(d)(1), (d)(3)). Here, the issuance of regulations under section 101(a)(5)(A) of the MMPA is a substantive action that relieves the statutory prohibition on the taking of marine mammals, specifically, the incidental taking of marine mammals associated with Dominion Energy's specified activities during the construction of the CVOW–C Project offshore of Virginia. Until the effective date of these regulations, Dominion Energy is prohibited from taking marine mammals incidental to the Project.

In addition, good cause exists for waiving the delay in effective date. Dominion Energy plans to conduct HRG surveys in early February 2024. Delays in this activity will impact construction activity sequencing and potentially vessel and other service procurement and availability. Moreover, offshore wind projects, such as the CVOW–C Project, that are developed to generate renewable energy have great societal and economic importance, and delays in completing the project are contrary to the public interest.

Finally, Dominion Energy has informed NMFS that it does not require 30 days to prepare for implementation of the regulations and requests that this final rule take effect on or before February 5, 2024. For these reasons, the subject regulations will be made immediately effective upon publication.

List of Subjects in 50 CFR Part 217

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

Dated: January 4, 2024.

Samuel D. Rauch, III,

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

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

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

■ 1. The authority citation for part 217 continues to read:

Authority: 16 U.S.C. 1361 *et seq.,* unless otherwise noted.

■ 2. Add subpart DD, consisting of §§ 217.290 through 217.299, to read as follows:

Subpart DD—Taking Marine Mammals Incidental to the Coastal Virginia Offshore Wind Commercial Project Offshore of Virginia

Subpart DD—Taking Marine Mammals Incidental to the Coastal Virginia Offshore Wind Commercial Project Offshore of Virginia

§ 217.290 Specified activity and specified geographical region.

(a) Regulations in this subpart apply to activities associated with the Coastal Virginia Offshore Wind Commercial Project (hereafter referred to as the ''Project'') by the Virginia Electric and Power Company, doing business as Dominion Energy Virginia (hereafter referred to as ''LOA Holder''), and those persons it authorizes or funds to conduct activities on its behalf in the area outlined in paragraph (b) of this section. Requirements imposed on the LOA Holder must be implemented by those persons it authorizes or funds to conduct activities on its behalf.

(b) The specified geographical region is the Mid-Atlantic Bight, which includes, but is not limited to, the Bureau of Ocean Energy Management (BOEM) Lease Area Outer Continental Shelf (OCS)–A 0483 Commercial Lease of Submerged Lands for Renewable Energy Development, one export cable route, and one sea-to-shore transition point located at the State Military Reservation in Virginia Beach, Virginia.

(c) The specified activities are vibratory and impact pile driving of wind turbine generator (WTGs) and offshore substation (OSSs) foundations; vibratory pile driving (install and subsequently removal) of cofferdams; impact pile driving (install and subsequently removal) of goal posts; fishery and ecological monitoring surveys; placement of scour protection; trenching, laying, and burial activities associated with the installation of the export cable from OSSs to shore-based converter stations and inter-array cables between turbines; high-resolution geophysical (HRG) site characterization surveys; vessel transit within the specified geographical region to transport crew, supplies, and materials; and WTG operation.

§ 217.291 Effective dates.

The regulations in this subpart are effective from February 5, 2024, through February 4, 2029.

§ 217.292 Permissible methods of taking.

Under a LOA, issued pursuant to §§ 216.106 and 217.296, LOA Holder and those persons it authorizes or funds to conduct activities on its behalf may incidentally, but not intentionally, take marine mammals within BOEM Lease Area OCS–A 0483 Commercial Lease of Submerged Lands for Renewable Energy Development, along export cable routes, and at the sea-to-shore transition point located at the State Military Reservation in Virginia Beach, Virginia in the following ways, provided LOA Holder is in complete compliance with all terms, conditions, and requirements of the regulations in this subpart and the appropriate LOA:

(a) By Level B harassment associated with the acoustic disturbance of marine mammals by impact and vibratory pile driving (WTG and OSS foundation installation), impact pile driving of goal posts, vibratory pile driving of temporary cofferdams, and HRG site characterization surveys; and

(b) By Level A harassment associated with the acoustic disturbance of marine mammals by impact pile driving WTG and OSS foundations.

(c) Take by mortality or serious injury of any marine mammal species is not authorized.

(d) The incidental take of marine mammals by the activities listed in paragraphs (a) and (b) of this section is limited to the following stocks:

TABLE 1 TO PARAGRAPH (d)

Marine mammal species	Scientific name	Stock
North Atlantic right whale	*Eubalaena glacialis*	Western North Atlantic.
Fin whale	*Balaenoptera physalus*	Western North Atlantic.
Humpback whale	*Megaptera novaeangliae*	Gulf of Maine.
Minke whale	*Balaenoptera acutorostrata*	Canadian Eastern Coastal.
Sei whale	*Balaenoptera borealis*	Nova Scotia.
Sperm whale	*Physeter macrocephalus*	North Atlantic.
Pygmy sperm whale	*Kogia breviceps*	Western North Atlantic.
Atlantic spotted dolphin	*Stenella frontalis*	Western North Atlantic.
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Western North Atlantic.
Bottlenose dolphin	*Tursiops truncatus*	Western North Atlantic—Offshore. Southern Migratory Coastal.
Clymene dolphin	*Stenella clymene*	Western North Atlantic.
Common dolphin	*Delphinus delphis*	Western North Atlantic.
False killer whale	*Pseudorca crassidens*	Western North Atlantic.
Melon-headed whale	*Peponocephala electra*	Western North Atlantic.
Long-finned pilot whale	*Globicephala melas*	Western North Atlantic.
Short-finned pilot whale	*Globicephala macrorhynchus*	Western North Atlantic.
Pantropical spotted dolphin	*Stenella attenuata*	Western North Atlantic.
Risso's dolphin	*Grampus griseus*	Western North Atlantic.
Harbor porpoise	*Phocoena phocoena*	Gulf of Maine/Bay of Fundy.
Gray seal	*Halichoerus grypus*	Western North Atlantic.
Harbor seal	*Phoca vitulina*	Western North Atlantic.

§ 217.293 Prohibitions.

Except for the takings described in § 217.292 and authorized by an LOA issued under §§ 217.296 or 217.297, it is unlawful for any person to do any of the following in connection with the activities described in this subpart:

(a) Violate, or fail to comply with, the terms, conditions, and requirements of this subpart or an LOA issued under §§ 217.296 or 217.297;

(b) Take any marine mammal not specified in § 217.292(d);

(c) Take any marine mammal specified in the LOA in any manner other than as specified in the LOA; or

(d) Take any marine mammal specified in § 217.292(d), after NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammals.

§ 217.294 Mitigation requirements.

When conducting the activities identified in § 217.290(c) within the area described in § 217.290(b), LOA Holder must implement the mitigation measures contained in this section and any LOA issued under §§ 217.296 or 217.297. These mitigation measures include, but are not limited to:

(a) *General conditions.* LOA Holder must comply with the following general measures:

(1) A copy of any issued LOA must be in the possession of LOA Holder and its designees, all vessel operators, visual protected species observers (PSOs), passive acoustic monitoring (PAM) operators, pile driver operators, and any other relevant designees operating under the authority of the issued LOA;

(2) LOA Holder must conduct training for construction, survey, and vessel personnel and the marine mammal monitoring team (PSO and PAM operators) prior to the start of all in-water construction activities in order to explain responsibilities, communication procedures, marine mammal detection and identification, mitigation, monitoring, and reporting requirements, safety and operational procedures, and authorities of the marine mammal monitoring team(s). This training must be repeated for new personnel who join the work during the project. A description of the training program must be provided to NMFS at least 60 days prior to the initial training before in-water activities begin. Confirmation of all required training must be documented on a training course log sheet and reported to NMFS Office of Protected Resources prior to initiating project activities;

(3) Prior to and when conducting any in-water construction activities and vessel operations, LOA Holder personnel and contractors (*e.g.,* vessel operators, PSOs) must use available sources of information on North Atlantic right whale presence in or near the Project Area including daily monitoring of the Right Whale Sightings Advisory System, and monitoring of U.S. Coast Guard VHF Channel 16 throughout the day to receive notification of any sightings and/or information associated with any Slow Zones (*i.e.,* DMAs and/or acoustically-triggered slow zones) to provide situational awareness for both vessel operators, PSO(s), and PAM operator(s). The marine mammal monitoring team must monitor these systems no less than every 4 hours;

(4) Any marine mammal observed by project personnel must be immediately communicated to any on-duty PSOs, PAM operator(s), and all vessel captains. Any large whale observation or acoustic detection by PSOs or PAM operators must be conveyed to all vessel captains;

(5) For North Atlantic right whales, any visual detection by a PSO or acoustic detection by PAM operators at any distance (where applicable for the specified activities) must trigger a delay to the commencement of pile driving and HRG surveys;

(6) In the event that a large whale is sighted or acoustically detected that cannot be confirmed as a non-North Atlantic right whale, it must be treated as if it were a North Atlantic right whale for purposes of mitigation;

(7) Any PSO has the authority to call for a delay or shutdown of project activities. If a delay to commencing an activity is called for by a PSO, LOA Holder must take the required mitigative action. If a shutdown of an activity is called for by a PSO, LOA Holder must take the required mitigative action unless shutdown would result in imminent risk of injury or loss of life to an individual, pile refusal, or pile instability. Any disagreements between the Lead PSO and the activity operator or between the Lead PSO and another PSO regarding delays or shutdowns must only be discussed after the mitigative action has occurred;

(8) Any marine mammals observed within a clearance or shutdown zone must be allowed to remain in the area (*i.e.,* must leave of their own volition) prior to commencing pile driving activities or HRG surveys;

(9) If an individual from a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized take number has been met, is observed entering or within the relevant clearance zone prior to beginning a specified activity, the activity must be delayed. If an activity is ongoing and individual from a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized take number has been met, is observed entering or within the relevant shutdown zone, the activity must be shut down (*i.e.,* cease) immediately, unless shutdown would result in imminent risk of injury or loss of life to an individual, pile refusal, or pile instability. The activity must not commence or resume until the animal(s) has been confirmed to have left the clearance or shutdown zones and is on a path away from the applicable zone or after 15 minutes with no further sightings for small odontocetes and pinnipeds or 30 minutes with no further sightings for all other species;

(10) For in-water construction heavy machinery activities listed in § 217.290(c), if a marine mammal is on a path towards or comes within 10 meters (m; 32.8 feet (ft)) of equipment, LOA Holder must cease operations until the marine mammal has moved more than 10 m on a path away from the activity to avoid direct interaction with equipment;

(11) All vessels must be equipped with a properly installed, operational Automatic Identification System (AIS) device and LOA Holder must report all Maritime Mobile Service Identify (MMSI) numbers to NMFS Office of Protected Resources;

(12) By accepting the LOA, LOA Holder consents to on-site observation and inspections by Federal agency personnel (including NOAA personnel) during activities described in this subpart, for the purposes of evaluating the implementation and effectiveness of measures contained within the LOA and this subpart; and

(13) It is prohibited to assault, harm, harass (including sexually harass), oppose, impede, intimidate, impair, or in any way influence or interfere with a PSO, PAM Operator, or vessel crew member acting as an observer, or attempt the same. This prohibition includes, but is not limited to, any action that interferes with an observer's responsibilities, or that creates an intimidating, hostile, or offensive environment. Personnel may report any violations to the NMFS Office of Law Enforcement.

(b) *Vessel strike avoidance measures.* LOA Holder must comply with the following vessel strike avoidance measures while in the specified geographic region, unless an emergency situation presents a threat to the health, safety, or life of a person, or when a vessel is actively engaged in emergency rescue or response duties, including vessel-in-distress or environmental crisis response, and requires speeds in excess of 10 kn (11.5 miles per hour (mph)) to fulfill those responsibilities. An emergency is defined as a serious event that occurs without warning and requires immediate action to avert, control, or remedy harm. Speed over

ground will be used to measure all vessel speeds:

(1) Prior to the start of the Project's activities involving vessels, all vessel personnel must receive a protected species training that covers, at a minimum, identification of marine mammals that have the potential to occur where vessels would be operating; detection and observation methods in both good weather conditions (*i.e.,* clear visibility, low winds, low sea states) and bad weather conditions (*i.e.,* fog, high winds, high sea states, with glare); sighting communication protocols; all vessel speed and approach limit mitigation requirements (*e.g.,* vessel strike avoidance measures); and information and resources available to the project personnel regarding the applicability of Federal laws and regulations for protected species. This training must be repeated for any new vessel personnel who join the Project. Confirmation of the vessel personnel's training and understanding of the Incidental Take Authorization (ITA) requirements must be documented on a training course log sheet and reported to NMFS within 30 days of completion of training;

(2) All vessel operators, operating at any speed and regardless of their vessel's size, must slow down, stop their vessel, or alter course to avoid striking any marine mammal;

(3) All vessels, regardless of their size, operating at any speed must have a dedicated visual observer aboard and on duty at all times whose sole responsibility (*i.e.,* must not have duties other than observing) is to monitor for marine mammals within a 180° direction of the forward path of the vessel (90° port to 90° starboard) located at an appropriate vantage point for ensuring vessels are maintaining appropriate separation distances. Visual observers must be equipped with alternative monitoring technology (*e.g.,* night vision devices, infrared cameras) for periods of low visibility (*e.g.,* darkness, rain, fog, *etc.*). The dedicated visual observer must receive prior training on protected species detection and identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements in this subpart. These visual observers may be third-party observers (*i.e.,* NMFS-approved PSOs; *see* § 217.295(a)) or trained crew members (*see* (b)(1) of this section);

(4) At the onset of transiting and continuously thereafter, vessel operators must monitor the U.S. Coast Guard VHF Channel 16, over which North Atlantic right whale sightings are broadcasted. At the onset of transiting and at least once every 4 hours, vessel operators and/or trained crew member(s) must also monitor the project's Situational Awareness System (if applicable), WhaleAlert, and relevant NOAA information systems such as the Right Whale Sighting Advisory System (RWSAS) for the presence of North Atlantic right whales;

(5) Any large whale sighting by any project-personnel, including any LOA Holder staff, contractors, or vessel crew, must be immediately communicated to all project-associated vessel operators, PSOs, and PAM operators for situational awareness. Conversely, any large whale observation or detection via a sighting network (*e.g.,* Mysticetus or similar software) by PSOs or PAM operators must be conveyed to vessel operators and crew. An ongoing large whale sighting log sheet must be maintained on each vessel and retained for vessel operator(s) review each day prior to first day's transit for awareness of recent sightings;

(6) All vessel operators must abide by existing applicable vessel speed regulations (*see* 50 CFR 224.105). Nothing in this subpart exempts vessels from any other applicable marine mammal speed or approach regulations. Vessels must not travel over 10 kn from November 1st through April 30th, annually, in the specified geographic region, and must transit at 10 kn or less within any active North Atlantic right whale Slow Zone (*i.e.,* Dynamic Management Areas (DMAs) or acoustically-triggered slow zone);

(7) All vessel operators, regardless of their vessel's size, must immediately reduce vessel speed to 10 kn or less for at least 24 hours when a North Atlantic right whale is sighted at any distance by any project-related personnel or acoustically detected by any project-related PAM system. Each subsequent observation or acoustic detection in the Project area shall trigger an additional 24-hour period. If a North Atlantic right whale is reported by project personnel or via any of the monitoring systems (refer back to paragraph (b)(4) of this section) that vessel must operate at 10 kn (11.5 mph) or less for 24 hours following the reported detection;

(8) All vessels, regardless of size, must immediately reduce speed to 10 kn or less when any large whale, mother/calf pairs, or large assemblages of cetaceans are observed within 500 m (0.31 mi) of an underway vessel;

(9) If vessel(s) are traveling at speeds greater than 10 kn (*i.e.,* no speed restrictions are enacted) in the transit corridor (defined as from a port to the Lease Area or return), in addition to the required dedicated visual observer, LOA Holder must monitor the transit corridor in real-time with PAM prior to and during transits. If a North Atlantic right whale is detected via visual observation or PAM detection within or approaching the transit corridor, all vessels in the transit corridor must travel at 10 kn or less for 24 hours following the detection. Each subsequent detection shall trigger a 24-hour reset. A slowdown in the transit corridor expires when there has been no further visual or acoustic detection in the transit corridor in the past 24 hours;

(10) All vessels must maintain a minimum separation distance of 500 m from North Atlantic right whales. If underway, all vessels must steer a course away from any sighted North Atlantic right whale at 10 kn or less such that the 500-m minimum separation distance requirement is not violated. If a North Atlantic right whale is sighted within 500 m of an underway vessel, that vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m. If a whale is observed but cannot be confirmed as a species other than a North Atlantic right whale, the vessel operator must assume that it is a North Atlantic right whale and take the vessel strike avoidance measures described in this paragraph (b)(7) of this section;

(11) All vessels must maintain a minimum separation distance of 100 m (328 ft) from sperm whales and non-North Atlantic right whale baleen whales. If one of these species is sighted within 100 m of a transiting vessel, the vessel must shift the engine(s) to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 100 m;

(12) All vessels must maintain a minimum separation distance of 50 m (164 ft) from all delphinoid cetaceans and pinnipeds with an exception made for those that approach the vessel (*i.e.,* bow-riding dolphins). If a delphinid cetacean or pinniped is sighted within 50 m of a transiting vessel, the vessel must shift the engine to neutral, with an exception made for those that approach the vessel (*e.g.,* bow-riding dolphins). Engines must not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m;

(13) When a marine mammal(s) is sighted while the vessel(s) is transiting, the vessel must take action as necessary to avoid violating the relevant separation distances (*e.g.,* attempt to remain parallel to the animal's course, slow down, and avoid abrupt changes in direction until the animal has left the

area). This measure does not apply to any vessel towing gear or any situation where respecting the relevant separation distance would be unsafe (*i.e.,* any situation where the vessel is navigationally constrained);

(14) All vessels underway must not divert or alter course to approach any marine mammal;

(15) Vessel operators must check, daily, for information regarding the establishment of mandatory or voluntary vessel strike avoidance areas (*i.e.,* DMAs, Seasonal Management Areas, Slow Zones) and any information regarding North Atlantic right whale sighting locations; and

(16) LOA Holder must submit a North Atlantic Right Whale Vessel Strike Avoidance Plan to NMFS Office of Protected Resources for review and approval at least 180 days prior to the planned start of vessel activity. The plan must provide details on the vessel-based observer and PAM protocols for transiting vessels in the vessel transit corridor. If a plan is not submitted and approved by NMFS prior to vessel operations, all project vessels must travel at speeds of 10 kn (11.5 mph) or less. LOA Holder must comply with any approved North Atlantic Right Whale Vessel Strike Avoidance Plan.

(c) *WTG and OSS foundation installation.* The following requirements apply to pile driving activities associated with the installation of WTG and OSS foundations:

(1) Vibratory and impact pile driving of foundation piles must not occur November 1st through April 30th, annually;

(2) Monopiles must be no larger than 9.5-m in diameter, representing the larger end of the tapered 9.5/7.5-m monopile design. Pin piles must be no larger than 2.8-m in diameter. During all monopile and pin pile installation, the minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. Hammer energies must not exceed 4,000 kilojoules (kJ) for monopile installations and 3,000 kJ for pin pile installation. No more than two monopile foundation or two pin piles for jacket foundations may be installed per day;

(3) LOA Holder may initiate foundation pile driving (*i.e.,* vibratory and impact) only from May 1st through October 31st, annually, in accordance with the NMFS-approved Pile Driving Plan;

(4) LOA Holder must only perform foundation pile driving during daylight hours, defined as no later than 1.5 hours prior to civil sunset and no earlier than 1 hour after civil sunrise, and may only continue into darkness if stopping operations represents a risk to human health, safety, and/or pile stability and an Alternative Monitoring Plan has been approved by NMFS. No new pile driving may begin when pile driving continues into darkness;

(5) LOA Holder must utilize a soft-start protocol at the beginning of foundation installation for each impact pile driving event. No soft-start for vibratory pile driving is necessary;

(6) Soft-start must occur at the beginning of impact driving and at any time following a cessation of impact pile driving of 30 minutes or longer;

(7) LOA Holder must establish clearance and shutdown zones, which must be measured using the radial distance around the pile being driven. Clearance monitoring must begin 60 minutes immediately prior to initiation of pile driving. If a marine mammal is detected within or about to enter the applicable clearance zones 30 minutes prior to the beginning of pile driving (including soft start if impact pile driving) or during pile driving, pile driving must be delayed or shutdown until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings. The specific time periods are 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other species;

(8) For North Atlantic right whales, any visual observation or acoustic detection must trigger a delay to the commencement of pile driving. The clearance zone may only be declared clear if no North Atlantic right whale acoustic or visual detections have occurred within the clearance zone during the 60-minute monitoring period;

(9) LOA Holder must deploy at least two functional noise abatement systems that reduce noise levels to the modeled harassment isopleths, assuming 10-dB attenuation, during all foundation pile driving:

(i) At least a double bubble curtain must be used;

(ii) Any bubble curtain(s) must distribute air bubbles using an air flow rate of at least 0.5 m^3/(minute*m). The bubble curtain(s) must surround 100 percent of the piling perimeter throughout the full depth of the water column. In the unforeseen event of a single compressor malfunction, the offshore personnel operating the bubble curtain(s) must adjust the air supply and operating pressure such that the maximum possible sound attenuation performance of the bubble curtain(s) is achieved;

(iii) The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100-percent seafloor contact;

(iv) No parts of the ring or other objects may prevent full seafloor contact with a bubble curtain ring;

(v) Construction contractors must train personnel in the proper balancing of airflow to the bubble curtain ring. LOA Holder must provide NMFS Office of Protected Resources with a bubble curtain performance test and maintenance report to review within 72 hours after each pile using a bubble curtain is installed. Additionally, a full maintenance check (*e.g.,* manually clearing holes) must occur prior to each pile being installed;

(vi) Corrections to the bubble ring(s) to meet the performance standards in this paragraph (c)(9) must occur prior to pile driving of foundation piles.

(vii) For any noise mitigation device in addition to the bubble curtain, LOA Holder must inspect and carry out appropriate maintenance on the system and ensure the system is functioning properly prior to every pile driving event.

(10) LOA Holder must utilize NMFS-approved PAM systems, as described in paragraph (c)(17) of this section. The PAM system components (*i.e.,* acoustic buoys) must not be placed closer than 1 km (0.6 mi) to the pile being driven so that the activities do not mask the PAM system. LOA Holder must demonstrate and prove the detection range of the system they plan to deploy while considering potential masking from concurrent pile-driving and vessel noise. The PAM system must be able to detect a vocalization of North Atlantic right whales up to 10 km (6.2 mi);

(11) LOA Holder must utilize PSO(s) and PAM operator(s), as described in § 217.295(c). At least three on-duty PSOs must be on the pile driving platform. Additionally, two dedicated-PSO vessels must be used at least 60 minutes before, during, and 30 minutes after all pile driving, and each dedicated-PSO vessel must have at least three PSOs on duty during these time periods. LOA Holder may request NMFS approval to use alternative technology *in lieu* of one or two of the dedicated PSO vessels that provide similar marine mammal detection capabilities.

(12) If a marine mammal is detected (visually or acoustically) entering or within the respective shutdown zone after pile driving has begun, the PSO must call for a shutdown of pile driving and LOA Holder must stop pile driving immediately, unless shutdown is not

practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or the lead engineer determines there is risk of pile refusal or pile instability. If pile driving is not shut down due to one of these situations, LOA Holder must reduce hammer energy to the lowest level practicable and the reason(s) for not shutting down must be documented and reported to NMFS Office of Protected Resources within the applicable monitoring reports (*e.g.,* weekly, monthly) (*see* 217.295(g));

(13) A visual observation at any distance from a PSO or acoustic detection of a North Atlantic right whale triggers shutdown requirements under paragraph (c)(12) of this section. If pile driving has been shut down due to the presence of a North Atlantic right whale, pile driving may not restart until the North Atlantic right whale has neither been visually or acoustically detected for 30 minutes;

(14) If pile driving has been shut down due to the presence of a marine mammal other than a North Atlantic right whale, pile driving must not restart until either the marine mammal(s) has voluntarily left the specific clearance zones and has been visually or acoustically confirmed beyond that clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections have occurred. The specific time periods are 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other marine mammal species. In cases where these criteria are not met, pile driving may restart only if necessary to maintain pile stability at which time LOA Holder must use the lowest hammer energy practicable to maintain stability;

(15) LOA Holder must conduct sound field verification (SFV) measurements during pile driving activities associated with the installation of, at minimum, the first three monopile foundations and for all three OSS foundations (for all 12 pin piles installed). SFV measurements must continue until at least three consecutive piles demonstrate noise levels are at or below those modeled, assuming 10 decibels (dB) of attenuation. Subsequent SFV measurements are also required should larger piles be installed or if additional monopiles are driven that may produce louder sound fields than those previously measured (*e.g.,* higher hammer energy, greater number of strikes, *etc.*). SFV measurements must be conducted as follows:

(i) Measurements must be made at a minimum of four distances from the pile(s) being driven, along a single transect, in the direction of lowest transmission loss (*i.e.,* projected lowest transmission loss coefficient), including, but not limited to, 750 m (2,460 ft) and three additional ranges, including, at least, the modeled Level B harassment isopleth assuming 10 dB attenuation. At least one additional measurement at an azimuth 90 degrees from the array at 750 m must be made. At each location, there must be a near bottom and mid-water column hydrophone;

(ii) The recordings must be continuous throughout the duration of all pile driving of each foundation;

(iii) The SFV measurement systems must have a sensitivity appropriate for the expected sound levels from pile driving received at the nominal ranges throughout the installation of the pile. The frequency range of SFV measurement systems must cover the range of at least 20 hertz (Hz) to 20 kilohertz (kHz). The SFV measurement systems must be designed to have omnidirectional sensitivity so that the broadband received level of all pile driving exceeds the system noise floor by at least 10 dB. The dynamic range of the SFV measurement system must be sufficient such that at each location, and the signals avoid poor signal-to-noise ratios for low amplitude signals and avoid clipping, nonlinearity, and saturation for high amplitude signals;

(iv) All hydrophones used in SFV measurements systems are required to have undergone a full system, traceable laboratory calibration conforming to International Electrotechnical Commission (IEC) 60565, or an equivalent standard procedure, from a factory or accredited source to ensure the hydrophone receives accurate sound levels, at a date not to exceed 2 years before deployment. Additional *in-situ* calibration checks using a pistonphone are required to be performed before and after each hydrophone deployment. If the measurement system employs filters via hardware or software (*e.g.,* high-pass, low-pass, *etc.*), which is not already accounted for by the calibration, the filter performance (*i.e.,* the filter's frequency response) must be known, reported, and the data corrected before analysis.

(v) LOA Holder must be prepared with additional equipment (hydrophones, recording devices, hydrophone calibrators, cables, batteries, *etc.*), which exceeds the amount of equipment necessary to perform the measurements, such that technical issues can be mitigated before measurement;

(vi) LOA Holder must submit interim reports within 48 hours after each foundation is measured (see § 217.295(g) section for interim and final reporting requirements);

(vii) LOA Holder must not exceed modeled distances to NMFS marine mammal Level A harassment and Level B harassment thresholds, assuming 10-dB attenuation, for foundation installation. If any of the interim SFV measurement reports submitted indicate the modeled distances to NMFS marine mammal Level A harassment and Level B harassment thresholds assuming 10-dB attenuation, then LOA Holder must implement additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances on all subsequent foundations. LOA Holder must also increase clearance and shutdown zone sizes to those identified by NMFS until SFV measurements on at least three additional foundations demonstrate acoustic distances to harassment thresholds meet or are less than those modeled assuming 10-dB of attenuation. In this situation, LOA Holder would be required to provide a proposed monitoring plan for expanded zones (per the Biological Opinion) that would detail the proposed expanded zones and any additional monitoring and mitigation that would be implemented. If the harassment zones are expanded beyond an additional 1,500 m (0.93 mi), additional PSOs must be deployed on additional platforms, with each observer responsible for maintaining watch in no more than 180 degrees and of an area with a radius no greater than 1,500 m.

(viii) LOA Holder must optimize the sound attenuation systems (*e.g.,* ensure hose maintenance, pressure testing, *etc.*) to, at least, meet noise levels modeled, assuming 10-dB attenuation, within three piles or else foundation installation activities must cease until NMFS and LOA Holder can evaluate the situation and ensure future piles must not exceed noise levels modeled assuming 10-dB attenuation;

(ix) If, after additional measurements conducted pursuant to requirements of paragraph (15)(vii) of this section, acoustic measurements indicate that ranges to isopleths corresponding to the Level A harassment and Level B harassment thresholds are less than the ranges predicted by modeling (assuming 10-dB attenuation), LOA Holder may request to NMFS Office of Protected Resources a modification of the clearance and shutdown zones. For NMFS Office of Protected Resources to consider a modification request for reduced zone sizes, LOA Holder must have conducted SFV measurements on

an additional three WTG monopile foundations and ensure that subsequent foundations would be installed under conditions that are predicted to produce smaller harassment zones than those modeled assuming 10-dB of attenuation;

(x) LOA Holder must conduct SFV measurements upon commencement of turbine operations to estimate turbine operational source levels and transmission loss rates, in accordance with a NMFS-approved Foundation Installation Pile Driving SFV Plan. SFV must be conducted in the same manner as previously described in paragraph (c)(15) of this section, with appropriate adjustments to measurement distances, number of hydrophones, and hydrophone sensitivities being made, as necessary; and

(xi) LOA Holder must submit a SFV Plan to NMFS Office of Protected Resources for review and approval at least 180 days prior to planned start of foundation installation activities and abide by the Plan if approved. At minimum, the SFV Plan must describe how LOA Holder would ensure that the first three monopile foundation installation sites selected for SFV measurements are representative of the rest of the monopile installation sites such that future pile installation events are anticipated to produce similar sound levels to those piles measured. In the case that these sites/scenarios are not determined to be representative of all other pile installation sites, LOA Holder must include information in the SFV Plan on how additional sites/scenarios would be selected for SFV measurements. This SFV Plan must also describe approaches that LOA Holder could take to adjust noise attenuation systems or add systems in the case that any SFV measurements obtained demonstrate that noise levels are above those modeled (assuming 10 dB of attenuation). Furthermore, the SFV Plan must also include how operational noise would be monitored. Operational parameters (*e.g.,* direct drive information, turbine rotation rate) as well as sea state conditions and information on nearby anthropogenic activities (*e.g.,* vessels transiting or operating in the area) must be reported. Additionally, the SFV Plan must also include methodology for collecting, analyzing, and preparing SFV measurement data for submission to NMFS Office of Protected Resources and describe how the effectiveness of the sound attenuation methodology would be evaluated based on the results. SFV for pile driving may not occur until NMFS approves the SFV Plan for this activity.

(16) LOA Holder must submit a Foundation Installation Pile Driving Marine Mammal Monitoring Plan to NMFS Office of Protected Resources for review and approval at least 180 days prior to planned start of foundation pile driving and abide by the Plan if approved. LOA Holder must obtain both NMFS Office of Protected Resources and NMFS Greater Atlantic Regional Fisheries Office Protected Resources Division's concurrence with this Plan prior to the start of any pile driving. The Plan must include, at a minimum: the final pile driving project design (*e.g.,* number and type of piles, hammer type, noise abatement systems, anticipated start date, *etc.*) and a description of all monitoring equipment and PAM operator and PSO protocols (including number and location of PSOs and PAM operators) for all foundation pile driving. No foundation pile installation can occur without NMFS' approval of the Plan; and

(17) LOA Holder must submit a Passive Acoustic Monitoring Plan (PAM Plan) to NMFS Office of Protected Resources for review and approval at least 180 days prior to the planned start of foundation installation activities and abide by the Plan if approved. The PAM Plan must include a description of all proposed PAM equipment, address how the proposed passive acoustic monitoring must follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind. The Plan must describe all proposed PAM equipment, procedures, and protocols including proof that vocalizing North Atlantic right whales will be detected within the clearance and shutdown zones. No pile installation can occur if LOA Holder's PAM Plan does not receive approval from NMFS Office of Protected Resources and NMFS Greater Atlantic Regional Fisheries Office Protected Resources Division.

(d) *Cofferdam and goal post installation and removal.* The following requirements apply to the installation and removal of cofferdams and goal posts at the cable landfall construction sites:

(1) Installation and removal of cofferdams and goal posts must not occur during nighttime hours (defined as the hours between 1.5 hours prior to civil sunset and 1 hour after civil sunrise);

(2) LOA Holder must establish and implement clearance zones for the installation and removal of cofferdams and goal posts using visual monitoring. These zones must be measured using the radial distance from the cofferdam and goal post being installed and/or removed;

(3) LOA Holder must utilize PSO(s), as described in § 217.295(d). At least two on-duty PSOs must monitor for marine mammals at least 30 minutes before, during, and 30 minutes after vibratory and impact pile driving associated with cofferdam and casing pipe installation, respectively;

(4) If a marine mammal(s) is observed entering or is observed within the clearance zones, before vibratory or impact pile driving has begun, the activity must not commence until the animal(s) has exited the zone or a specific amount of time has elapsed since the last sighting. The specific time periods are 15 minutes for small odontocetes and pinnipeds and 30 minutes for all other marine mammal species;

(5) If a marine mammal is observed entering or within the respective shutdown zone after vibratory or impact pile driving has begun, the PSO must call for a shutdown of pile driving. LOA Holder must stop pile driving immediately unless shutdown is not practicable due to imminent risk of injury or loss of life to an individual or if there is a risk of damage to the vessel that would create a risk of injury or loss of life for individuals or if the lead engineer determines there is refusal or instability. In any of these situations, LOA Holder must document the reason(s) for not shutting down and report the information to NMFS Office of Protected Resources in the annual report (as described in § 217.295(g)). In cases where shutdown is not feasible, pile driving may restart only if necessary to maintain pile stability at which time LOA Holder must use the lowest hammer energy practicable to maintain stability;

(6) Pile driving must not restart until either the marine mammal(s) has voluntarily left the specific clearance zones and has been visually or acoustically confirmed beyond that clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections have occurred. The specific time periods are 15 minutes for small odontocetes and pinnipeds and 30 minutes for all other marine mammal species; and

(7) LOA Holder must employ a soft-start for all impact pile driving of goal posts. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets.

(e) *HRG surveys.* The following requirements apply to HRG surveys operating sub- bottom profilers (SBPs)

(*i.e.,* boomers, sparkers, and Compressed High Intensity Radiated Pulse (CHIRPs)):

(1) LOA Holder must establish and implement clearance and shutdown zones for HRG surveys using visual monitoring, as described in paragraph (c) of this section;

(2) LOA Holder must utilize PSO(s), as described in § 217.295(e);

(3) LOA Holder must abide by the relevant Project Design Criteria (PDCs 4, 5, and 7) of the programmatic consultation completed by NMFS' Greater Atlantic Regional Fisheries Office on June 29, 2021 (revised September 2021), pursuant to section 7 of the Endangered Species Act (ESA). To the extent that any relevant Best Management Practices (BMPs) described in these PDCs are more stringent than the requirements herein, those BMPs supersede these requirements;

(4) SBPs (hereinafter referred to as ''acoustic sources'') must be deactivated when not acquiring data or preparing to acquire data, except as necessary for testing. Acoustic sources must be used at the lowest practicable source level to meet the survey objective, when in use, and must be turned off when they are not necessary for the survey;

(5) Prior to starting the survey and after receiving confirmation from the PSOs that the clearance zone is clear of any marine mammals, LOA Holder is required to ramp-up acoustic sources to half power for 5 minutes prior to commencing full power, unless the equipment operates on a binary on/off switch (in which case ramp-up is not required). LOA Holder must also ensure visual clearance zones are fully visible (*e.g.,* not obscured by darkness, rain, fog, *etc.*) and clear of marine mammals, as determined by the Lead PSO, for at least 30 minutes immediately prior to the initiation of survey activities using acoustic sources.

(6) Ramp-up and activation must be delayed if a marine mammal(s) enters its respective shutdown zone. Ramp-up and activation may only be reinitiated if the animal(s) has been observed exiting its respective shutdown zone or until 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other species, has elapsed with no further sightings;

(7) Prior to a ramp-up procedure starting or activating acoustic sources, the acoustic source operator (operator) must notify a designated PSO of the planned start of ramp-up as agreed upon with the Lead PSO. The notification time should not be less than 60 minutes prior to the planned ramp-up or activation in order to allow the PSOs time to monitor the clearance zone(s) for 30 minutes prior to the initiation of ramp-up or activation (pre-start clearance). During this 30-minute pre-start clearance period, the entire applicable clearance zones must be visible, except as indicated in paragraph (f)(12) of this section;

(8) Ramp-ups must be scheduled so as to minimize the time spent with the source activated;

(9) A PSO conducting pre-start clearance observations must be notified again immediately prior to reinitiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed;

(10) LOA Holder must implement a 30-minute clearance period of the clearance zones immediately prior to the commencing of the survey or when there is more than a 30-minute break in survey activities or PSO monitoring. A clearance period is a period when no marine mammals are detected in the relevant zone;

(11) If a marine mammal is observed within a clearance zone during the clearance period, ramp-up or acoustic surveys may not begin until the animal(s) has been observed voluntarily exiting its respective clearance zone or until a specific time period has elapsed with no further sighting. The specific time period is 15 minutes for small odontocetes and pinnipeds, and 30 minutes for all other species;

(12) In any case when the clearance process has begun in conditions with good visibility, including via the use of night vision equipment (infrared (IR)/thermal camera), and the Lead PSO has determined that the clearance zones are clear of marine mammals, survey operations may commence (*i.e.,* no delay is required) despite periods of inclement weather and/or loss of daylight. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of marine mammals in the 30 minutes prior to beginning ramp-up;

(13) Once the survey has commenced, LOA Holder must shut down acoustic sources if a marine mammal enters a respective shutdown zone, except in cases when the shutdown zones become obscured for brief periods due to inclement weather, survey operations may continue (*i.e.,* no shutdown is required) so long as no marine mammals have been detected. The shutdown requirement does not apply to small delphinids of the following genera: *Delphinus, Stenella, Lagenorhynchus,* and *Tursiops.* If there is uncertainty regarding the identification of a marine mammal species (*i.e.,* whether the observed marine mammal belongs to one of the delphinid genera for which shutdown is waived), the PSOs must use their best professional judgment in making the decision to call for a shutdown. Shutdown is required if a delphinid that belongs to a genus other than those specified in this paragraph (f)(13) of this section is detected in the shutdown zone;

(14) If an acoustic source has been shut down due to the presence of a marine mammal, the use of an acoustic source may not commence or resume until the animal(s) has been confirmed to have left the Level B harassment zone or until a full 15 minutes (for small odontocetes and seals) or 30 minutes (for all other marine mammals) have elapsed with no further sighting;

(15) LOA Holder must immediately shut down any acoustic source if a marine mammal is sighted entering or within its respective shutdown zones. If there is uncertainty regarding the identification of a marine mammal species (*i.e.,* whether the observed marine mammal belongs to one of the delphinid genera for which shutdown is waived), the PSOs must use their best professional judgment in making the decision to call for a shutdown. Shutdown is required if a delphinid that belongs to a genus other than those specified in paragraph (f)(13) of this section is detected in the shutdown zone; and

(16) If an acoustic source is shut down for a period longer than 30 minutes, all clearance and ramp-up procedures must be initiated. If an acoustic source is shut down for reasons other than mitigation (*e.g.,* mechanical difficulty) for less than 30 minutes, acoustic sources may be activated again without ramp-up only if PSOs have maintained constant observation and no additional detections of any marine mammal occurred within the respective shutdown zones.

(f) *Fisheries monitoring surveys.* The following measures apply to fishery monitoring surveys: using trap/pot gear:

(1) Survey gear must be deployed as soon as possible once the vessel arrives on station. Gear must not be deployed if there is a risk of interaction with marine mammals. Gear may be deployed after 15 minutes of no marine mammal sightings within 1 nautical mile (nmi; 1,852 m) of the sampling station;

(2) LOA Holder and/or its cooperating institutions, contracted vessels, or commercially hired captains must implement the following ''move-on'' rule: If marine mammals are sighted within 1 nautical mile (nmi (1.2 mi)) of the planned location and 15 minutes before gear deployment, then LOA

Holder and/or its cooperating institutions, contracted vessels, or commercially hired captains, as appropriate, must move the vessel away from the marine mammal to a different section of the sampling area. If, after moving on, marine mammals are still visible from the vessel, LOA Holder and its cooperating institutions, contracted vessels, or commercially hired captains must move again or skip the station;

(3) If a marine mammal is at risk of interacting with deployed gear, all gear must be immediately removed from the water. If marine mammals are sighted before the gear is fully removed from the water, the vessel must slow its speed and maneuver the vessel away from the animals to minimize potential interactions with the observed animal;

(4) Unless using ropeless gear, LOA Holder must maintain visual marine mammal monitoring effort during the entire period of time that gear is in the water (*i.e.,* throughout gear deployment, fishing, and retrieval);

(5) All fisheries monitoring gear must be fully cleaned and repaired (if damaged) before each use/deployment;

(6) LOA Holder's fixed gear must comply with the Atlantic Large Whale Take Reduction Plan regulations at 50 CFR 229.32 during fisheries monitoring surveys;

(7) Trawl tows must be limited to a maximum of a 20-minute trawl time at 3.0 kn (3.5 mph);

(8) All gear must be emptied as close to the deck/sorting area and as quickly as possible after retrieval;

(9) All fishery survey-related lines must include the breaking strength of all lines being less than 1,700 pounds (lbs; 771 kilograms (kg)). This may be accomplished by using whole buoy line that has a breaking strength of 1,700 lbs; or buoy line with weak inserts that result in line having an overall breaking strength of 1,700 lbs;

(10) During any survey that uses vertical lines, buoy lines must be weighted and must not float at the surface of the water and all groundlines must consist of sinking lines. All groundlines must be composed entirely of sinking lines. Buoy lines must utilize weak links. Weak links must break cleanly leaving behind the bitter end of the line. The bitter end of the line must be free of any knots when the weak link breaks. Splices are not considered to be knots. The attachment of buoys, toggles, or other floatation devices to groundlines is prohibited;

(11) All in-water survey gear, including buoys, must be properly labeled with the scientific permit number or identification as LOA Holder's research gear. All labels and markings on the gear, buoys, and buoy lines must also be compliant with the applicable regulations, and all buoy markings must comply with instructions received by the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division;

(12) All survey gear must be removed from the water whenever not in active survey use (*i.e.,* no wet storage); and

(13) All reasonable efforts, that do not compromise human safety, must be undertaken to recover gear.

§ 217.295 Monitoring and reporting requirements.

(a) *Protected species observer (PSO) and passive acoustic monitoring (PAM) operator qualifications.* LOA Holder must implement the following measures applicable to PSOs and PAM operators:

(1) LOA Holder must use independent, NMFS-approved PSOs and PAM operators, meaning that the PSOs and PAM operators must be employed by a third-party observer provider, must have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant crew with regard to the presence of protected species and mitigation requirements;

(2) All PSOs and PAM operators must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO or PAM operator has acquired the relevant skills through a suitable amount of alternate experience. Requests for such a waiver must be submitted to NMFS Office of Protected Resources and must include written justification containing alternative experience. Alternate experience that may be considered includes but is not limited to: previous work experience conducting academic, commercial, or government-sponsored marine mammal visual and/or acoustic surveys; or previous work experience as a PSO/PAM operator. All PSOs and PAM operators should demonstrate good standing and consistently good performance of all assigned duties;

(3) PSOs must have visual acuity in both eyes (with correction of vision being permissible) sufficient enough to discern moving targets on the water's surface with the ability to estimate the target size and distance (binocular use is allowable); ability to conduct field observations and collect data according to the assigned protocols; sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; writing skills sufficient to document observations, including but not limited to, the number and species of marine mammals observed, the dates and times of when in-water construction activities were conducted, the dates and time when in-water construction activities were suspended to avoid potential incidental take of marine mammals from construction noise within a defined shutdown zone, and marine mammal behavior; and the ability to communicate orally, by radio, or in-person, with project personnel to provide real-time information on marine mammals observed in the area;

(4) All PSOs must be trained in northwestern Atlantic Ocean marine mammal identification and behaviors and must be able to conduct field observations and collect data according to assigned protocols. Additionally, PSOs must have the ability to work with all required and relevant software and equipment necessary during observations (as described in paragraphs (b)(5) and (b)(6) of this section);

(5) All PSOs and PAM operators must successfully complete a relevant training course within the last 5 years, including obtaining a certificate of course completion;

(6) PSOs and PAM operators are responsible for obtaining NMFS' approval. NMFS may approve PSOs and PAM operators as conditional or unconditional. A conditionally-approved PSO or PAM operator may be one who has completed training in the last 5 years but has not yet attained the requisite field experience. An unconditionally approved PSO or PAM operator is one who has completed training within the last 5 years and attained the necessary experience (*i.e.,* demonstrate experience with monitoring for marine mammals at clearance and shutdown zone sizes similar to those produced during the respective activity). A conditionally approved PSO or PAM operator must be paired with an unconditionally approved PSO or PAM operator;

(7) At least one on-duty PSO for each activity (*e.g.,* foundation installation, cable landfall construction, and HRG surveys) must be designated as the Lead PSO. The Lead PSO must meet the minimum requirements described in 217.295(a)(2) through (5) and have a minimum of ninety days of at-sea experience working in the Northwest Atlantic Ocean and would be required to have no more than eighteen months elapsed since the conclusion of their last at-sea experience;

(8) PSOs for cable landfall construction (*i.e.,* vibratory pile installation and removal) and HRG surveys may be unconditionally or conditionally approved. PSOs and PAM operators for foundation installation must be unconditionally approved;

(9) LOA Holder must submit NMFS previously approved PSOs and PAM operators to NMFS Office of Protected Resources for review and confirmation of their approval for specific roles at least 30 days prior to commencement of the activities requiring PSOs/PAM operators or 15 days prior to when new PSOs/PAM operators are required after activities have commenced;

(10) For prospective PSOs and PAM operators not previously approved, or for PSOs and PAM operators whose approval is not current, LOA Holder must submit resumes for approval at least 60 days prior to PSO and PAM operator use. Resumes must include information related to relevant education, experience, and training, including dates, duration, location, and description of prior PSO or PAM operator experience. Resumes must be accompanied by relevant documentation of successful completion of necessary training;

(11) PAM operators are responsible for obtaining NMFS approval. To be approved as a PAM operator, the person must meet the following qualifications: The PAM operator must demonstrate that they have prior experience with real-time acoustic detection systems and/or have completed specialized training for operating PAM systems and detecting and identifying Atlantic Ocean marine mammals sounds, in particular: North Atlantic right whale sounds, humpback whale sounds, and how to deconflict them from similar North Atlantic right whale sounds, and other co-occurring species' sounds in the area including sperm whales; must be able to distinguish between whether a marine mammal or other species sound is detected, possibly detected, not detected and similar terminology must be used across companies/projects; where localization of sounds or deriving bearings and distance are possible, the PAM operators need to have demonstrated experience in using this technique; PAM operators must be independent observers (*i.e.,* not construction personnel); PAM operators must demonstrate experience with relevant acoustic software and equipment; PAM operators must have the qualifications and relevant experience/training to safely deploy and retrieve equipment and program the software, as necessary; PAM operators must be able to test software and hardware functionality prior to operation; and PAM operators must have evaluated their acoustic detection software using the PAM Atlantic baleen whale annotated data set available at National Centers for Environmental Information (NCEI) and provide evaluation/performance metric;

(12) PAM operators must be able to review and classify acoustic detections in real-time (prioritizing North Atlantic right whales and noting detection of other cetaceans) during the real-time monitoring periods;

(13) PSOs may work as PAM operators and vice versa, pending NMFS-approval; however, they may only perform one role at any one time and must not exceed work time restrictions, which must be tallied cumulatively; and

(14) All PSOs and PAM operators must complete a Permits and Environmental Compliance Plan training and a 2-day refresher session that must be held with the PSO provider and Project compliance representative(s) prior to the start of in-water project activities (*e.g.,* HRG survey, foundation installation, cable landfall activities *etc.*).

(b) *General PSO and PAM operator requirements.* The following measures apply to PSOs and PAM operators and must be implemented by LOA Holder:

(1) PSOs must monitor for marine mammals prior to, during, and following all impact pile driving, vibratory pile driving, and HRG surveys that use sub-bottom profilers (with specific monitoring durations and needs described in paragraphs (c) through (f) of this section, respectively). Monitoring must be done while free from distractions and in a consistent, systematic, and diligent manner;

(2) All PSOs must be located at the best vantage point(s) on any platform, as determined by the Lead PSO, in order to obtain 360-degree visual coverage of the entire clearance and shutdown zones around the activity area, and as much of the Level B harassment zone as possible. PAM operators may be located on a vessel or remotely on-shore, but must have the appropriate equipment (*i.e.,* computer station equipped with a data collection software system and acoustic data analysis software) available wherever they are stationed, and data or data products must be streamed in real-time or in near real-time to allow PAM operators to provide assistance to on-duty visual PSOs. During foundation installation activities, the PAM operator(s) must monitor to and past the clearance zone for large whales and would assist PSOs in ensuring full coverage of the clearance and shutdown zones;

(3) All on-duty PSOs must remain in real-time contact with the on-duty PAM operator(s). PAM operators must immediately communicate all acoustic detections of marine mammals to PSOs, including any determination regarding species identification, distance, and bearing (where relevant) relative to the pile being driven and the degree of confidence (*e.g.,* possible, probable detection) in the determination. All on-duty PSOs and PAM operator(s) must remain in contact with the on-duty construction personnel responsible for implementing mitigations (*e.g.,* delay to pile driving) to ensure communication on marine mammal observations can easily, quickly, and consistently occur between all on-duty PSOs, PAM operator(s), and on-water Project personnel;

(4) The PAM operator must inform the Lead PSO(s) on duty of animal detections approaching or within applicable ranges of interest to the activity occurring via the data collection software system, (*e.g.,* Mysticetus or similar system) who must be responsible for requesting that the designated crewmember implement the necessary mitigation procedures (*i.e.,* delay);

(5) PSOs must use high magnification (25x) binoculars, standard handheld (7x) binoculars, and the naked eye to search continuously for marine mammals. During foundation installation, at least two PSOs on the pile driving-dedicated PSO vessel must be equipped with functional Big Eye binoculars (*e.g.,* 25 x 150; 2.7 view angle; individual ocular focus; height control); these must be pedestal mounted on the deck at the best vantage point that provides for optimal sea surface observation and PSO safety. PAM operators must have the appropriate equipment (*i.e.,* a computer station equipped with a data collection software system available wherever they are stationed) and use a NMFS-approved PAM system to conduct monitoring. PAM systems are approved through the PAM Plan as described in § 217.294(c)(17);

(6) During periods of low visibility (*e.g.,* darkness, rain, fog, poor weather conditions, *etc.*), PSOs must use alternative technology (*i.e.,* infrared or thermal cameras) to monitor the clearance and shutdown zones as approved by NMFS;

(7) PSOs and PAM operators must not exceed 4 consecutive watch hours on duty at any time, must have a 2-hour (minimum) break between watches, and must not exceed a combined watch

schedule of more than 12 hours in a 24-hour period. If the schedule includes PSOs and PAM operators on-duty for 2-hour shifts, a minimum 1-hour break between watches must be allowed; and

(8) During daylight hours when equipment is not operating, LOA Holder must ensure that visual PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-effort PSO monitoring must be reflected in the monthly PSO monitoring reports.

(c) *PSO and PAM operator requirements during WTG and OSS foundation installation.* The following measures apply to PSOs and PAM operators during WTG and OSS foundation installation and must be implemented by LOA Holder:

(1) PSOs and PAM operator(s), using a NMFS-approved PAM system, must monitor for marine mammals 60 minutes prior to, during, and 30 minutes following all pile-driving. If PSOs cannot visually monitor the minimum visibility zone prior to pile driving at all times using the equipment described in paragraphs (b)(5) and (6) of this section, pile-driving operations must not commence or must shutdown if they are currently active;

(2) At least three on-duty PSOs must be stationed and observing from the activity platform during pile driving and at least three on-duty PSOs must be stationed on each dedicated PSO vessel. Concurrently, at least one PAM operator per acoustic data stream (equivalent to the number of acoustic buoys) must be actively monitoring for marine mammals 60 minutes before, during, and 30 minutes after foundation pile driving in accordance with a NMFS-approved PAM Plan;

(3) LOA Holder must conduct PAM for at least 24 hours immediately prior to pile driving activities. The PAM operator must review all detections from the previous 24-hour period immediately prior to pile driving.

(d) *PSO requirements during cable landfall construction.* The following measures apply to PSOs during cofferdam and goal post installation and removal and must be implemented by LOA Holder:

(1) At least two PSOs must be on active duty during all activities related to the installation and removal of cofferdams and goal posts; and

(2) PSOs must monitor the clearance zone for the presence of marine mammals for 30 minutes before, throughout the installation of the sheet piles and casing pipe and for 30 minutes after all pile driving activities have ceased. Sheet pile or casing pipe installation must only commence when visual clearance zones are fully visible (*e.g.,* not obscured by darkness, rain, fog, *etc.*) and clear of marine mammals, as determined by the Lead PSO, for at least 30 minutes immediately prior to initiation of pile driving.

(e) *PSO requirements during HRG surveys.* The following measures apply to PSOs during HRG surveys using Compressed High Intensity Radiated Pulse (CHIRPs), boomers, and sparkers and must be implemented by LOA Holder:

(1) Between four and six PSOs must be present on every 24-hour survey vessel and two to three PSOs must be present on every 12-hour survey vessel;

(2) At least one PSO must be on active duty monitoring during HRG surveys conducted during daylight (*i.e.,* from 30 minutes prior to civil sunrise through 30 minutes following civil sunset) and at least two PSOs must be on active duty monitoring during HRG surveys conducted at night;

(3) PSOs on HRG vessels must begin monitoring 30 minutes prior to activating acoustic sources, during the use of these acoustic sources, and for 30 minutes after use of these acoustic sources has ceased;

(4) Any observations of marine mammals must be communicated to PSOs on all nearby survey vessels during concurrent HRG surveys; and

(5) During daylight hours when survey equipment is not operating, LOA Holder must ensure that visual PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-effort PSO monitoring must be reflected in the monthly PSO monitoring reports.

(f) *Monitoring requirements during fisheries monitoring surveys.* The following measures apply during fisheries monitoring surveys and must be implemented by LOA Holder:

(1) All captains and crew conducting fishery surveys must be trained in marine mammal detection and identification; and

(2) Marine mammal monitoring must be conducted within 1 nmi from the planned survey location by the trained captain and/or a member of the scientific crew for 15 minutes prior to deploying gear, throughout gear deployment and use (unless using ropeless gear), and for 15 minutes after haul back.

(g) *Reporting.* LOA Holder must comply with the following reporting measures:

(1) Prior to initiation of any specified activities, LOA Holder must demonstrate in a report submitted to NMFS Office of Protected Resources that all required training for LOA Holder personnel (including the vessel crews, vessel captains, PSOs, and PAM operators) has been completed;

(2) LOA Holder must use a standardized reporting system during the effective period of the LOA. All data collected related to the Project must be recorded using industry-standard software that is installed on field laptops and/or tablets. Unless stated otherwise, all reports must be submitted to NMFS Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov*), dates must be in MM/DD/YYYY format, and location information must be provided in Decimal Degrees and with the coordinate system information (*e.g.,* NAD83, WGS84, *etc.*);

(3) For all visual monitoring efforts and marine mammal sightings, the following information must be collected and reported to NMFS Office of Protected Resources: the date and time that monitored activity begins or ends; the construction activities occurring during each observation period; the watch status (*i.e.,* sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform); the PSO who sighted the animal; the time of sighting; the weather parameters (*e.g.,* wind speed, percent cloud cover, visibility); the water conditions (*e.g.,* Beaufort sea state, tide state, water depth); all marine mammal sightings, regardless of distance from the construction activity; species (or lowest possible taxonomic level possible); the pace of the animal(s); the estimated number of animals (minimum/maximum/high/low/best); the estimated number of animals by cohort (*e.g.,* adults, yearlings, juveniles, calves, group composition, *etc.*); the description (*i.e.,* as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics); the description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling) and observed changes in behavior, including an assessment of behavioral responses thought to have resulted from the specific activity; the animal's closest distance and bearing from the pile being driven or specified HRG equipment and estimated time entered or spent within the Level A harassment and/or Level B harassment zone(s); the activity at time of sighting (*e.g.,* pile driving, construction surveys), use of any noise attenuation device(s), and specific phase of activity (*e.g.,* ramp-up of HRG equipment, HRG acoustic source on/off, soft-start for pile

driving, active pile driving, *etc.*); the marine mammal occurrence in Level A harassment or Level B harassment zones; the description of any mitigation-related action implemented, or mitigation-related actions called for but not implemented, in response to the sighting (*e.g.,* delay, shutdown, *etc.*) and time and location of the action; other human activity in the area, and; other applicable information, as required in any LOA issued under § 217.296;

(4) If a marine mammal is acoustically detected during PAM monitoring, the following information must be recorded and reported to NMFS: location of hydrophone (latitude and longitude; in Decimal Degrees) and site name; bottom depth and depth of recording unit (in meters); recorder (model & manufacturer) and platform type (*i.e.,* bottom-mounted, electric glider, etc.), and instrument ID of the hydrophone and recording platform (if applicable); time zone for sound files and recorded date/times in data and metadata (in relation to Universal Coordinated Time (UTC); *i.e.,* Eastern Standard Time (EST) time zone is UTC–5); duration of recordings (start/end dates and times; in International Organization for Standardization (ISO) 8601 format, yyyy-mm-ddTHH:MM:SS.sssZ); deployment/retrieval dates and times (in ISO 8601 format); recording schedule (must be continuous); hydrophone and recorder sensitivity (in dB re. 1 microPascal (μPa)); calibration curve for each recorder; bandwidth/sampling rate (in Hz); sample bit-rate of recordings; and detection range of equipment for relevant frequency bands (in meters);

(i) For each detection, the following information the following information must be noted: species identification (if possible); call type and number of calls (if known); temporal aspects of vocalization (date, time, duration, etc.; date times in ISO 8601 format); confidence of detection (detected, or possibly detected); comparison with any concurrent visual sightings; location and/or directionality of call (if determined) relative to acoustic recorder or construction activities; location of recorder and construction activities at time of call; name and version of detection or sound analysis software used, with protocol reference; minimum and maximum frequencies viewed/monitored/used in detection (in Hz); and name of PAM operator(s) on duty;

(5) LOA Holder must compile and submit weekly reports during foundation installation to NMFS Office of Protected Resources that document the daily start and stop of all pile driving associated with the Project; the start and stop of associated observation periods by PSOs; details on the deployment of PSOs; a record of all detections of marine mammals (acoustic and visual); any mitigation actions (or if mitigation actions could not be taken, provide reasons why); and details on the noise attenuation system(s) used and its performance. Weekly reports are due on Wednesday for the previous week (Sunday to Saturday) and must include the information required under this section. The weekly report must also identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is completed, weekly reports are no longer required by LOA Holder;

(6) LOA Holder must compile and submit monthly reports to NMFS Office of Protected Resources during foundation installation that include a summary of all information in the weekly reports, including project activities carried out in the previous month, vessel transits (number, type of vessel, MMIS number, and route), number of piles installed, all detections of marine mammals, and any mitigative action taken. Monthly reports are due on the 15th of the month for the previous month. The monthly report must also identify which turbines become operational and when (a map must be provided). Full PAM detection data and metadata must also be submitted monthly on the 15th of every month for the previous month via the webform on the NMFS North Atlantic Right Whale Passive Acoustic Reporting System website at *https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates;*

(7) LOA Holder must submit a draft annual report to NMFS Office of Protected Resources no later than 90 days following the end of a given calendar year. LOA Holder must provide a final report within 30 days following resolution of NMFS' comments on the draft report. The draft and final reports must detail the following: the total number of marine mammals of each species/stock detected and how many were within the designated Level A harassment and Level B harassment zone(s) with comparison to authorized take of marine mammals for the associated activity type; marine mammal detections and behavioral observations before, during, and after each activity; what mitigation measures were implemented (*i.e.,* number of shutdowns or clearance zone delays, *etc.*) or, if no mitigative actions was taken, why not; operational details (*i.e.,* days and duration of impact and vibratory pile driving, days, days and amount of HRG survey effort, *etc.*); any PAM systems used; the results, effectiveness, and which noise attenuation systems were used during relevant activities (*i.e.,* foundation pile driving); summarized information related to situational reporting; and any other important information relevant to the Project, including additional information that may be identified through the adaptive management process. The final annual report must be prepared and submitted within 30 calendar days following the receipt of any comments from NMFS on the draft report. If no comments are received from NMFS within 60 calendar days of NMFS' receipt of the draft report, the report must be considered final;

(8) LOA Holder must submit its draft 5-year report to NMFS Office of Protected Resources on all visual and acoustic monitoring conducted within 90 calendar days of the completion of activities occurring under the LOA. A 5-year report must be prepared and submitted within 60 calendar days following receipt of any NMFS Office of Protected Resources comments on the draft report. If no comments are received from NMFS Office of Protected Resources within 60 calendar days of NMFS Office of Protected Resources receipt of the draft report, the report shall be considered final;

(9) LOA Holder must provide the initial results of the complete SFV measurements to NMFS Office of Protected Resources in an interim report after each foundation installation event as soon as they are available and prior to any subsequent foundation installation, but no later than 48 hours after each completed foundation installation event. The report must include, at minimum: hammer energies/schedule used during pile driving, including, the total number of strikes and the maximum hammer energy; the model-estimated acoustic ranges ($R_{95\%}$) to compare with the real-world sound field measurements; peak sound pressure level (SPL_{pk}), root-mean-square sound pressure level that contains 90 percent of the acoustic energy (SPL_{rms}), and sound exposure level (SEL, in single strike for pile driving, SEL_{ss}), for each hydrophone, including at least the maximum, arithmetic mean, minimum, median (L50) and L5 (95 percent exceedance) statistics for each metric; estimated marine mammal Level A harassment and Level B harassment acoustic isopleths, calculated using the maximum-over-depth L5 (95 percent exceedance level, maximum of both hydrophones) of the associated sound metric; comparison of modeled results assuming 10-dB attenuation against the

measured marine mammal Level A harassment and Level B harassment acoustic isopleths; estimated transmission loss coefficients; pile identifier name, location of the pile and each hydrophone array in latitude/longitude; depths of each hydrophone; one-third-octave band single strike SEL spectra; if filtering is applied, full filter characteristics must be reported; and hydrophone specifications including the type, model, and sensitivity. LOA Holder must also report any immediate observations which are suspected to have a significant impact on the results including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, and technical issues with hydrophones or recording devices. If any *in-situ* calibration checks for hydrophones reveal a calibration drift greater than 0.75 dB, pistonphone calibration checks are inconclusive, or calibration checks are otherwise not effectively performed, LOA Holder must indicate full details of the calibration procedure, results, and any associated issues in the 48-hour interim reports;

(10) LOA Holder must conduct abbreviated SFV for all foundation installations for which the complete SFV monitoring is not carried out, whereas a single acoustic recorder must be placed at an appropriate distance from the pile, in alignment with the completed Biological Opinion. All results must be included in the weekly reports. Any indications that distances to the identified Level A harassment and Level B harassment thresholds for marine mammals were exceeded must be addressed by LOA Holder, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles;

(11) The final results of all SFV measurements from each foundation installation must be submitted as soon as possible, but no later than 90 days following completion of all annual SFV measurements. The final reports must include all details included in the interim report and descriptions of any notable occurrences, explanations for results that were not anticipated, or actions taken during foundation installation. The final report must also include at least the maximum, mean, minimum, median (L_{50}) and L_5 (95 percent exceedance) statistics for each metric; the SEL and SPL power spectral density and/or one-third octave band levels (usually calculated as decidecade band levels) at the receiver locations should be reported; range of transmission loss coefficients; the local environmental conditions, such as wind speed, transmission loss data collected on-site (or the sound velocity profile); baseline pre- and post-activity ambient sound levels (broadband and/or within frequencies of concern); a description of depth and sediment type, as documented in the Construction and Operation Plan (COP), at the recording and foundation installation locations; the extents of the measured Level A harassment and Level B harassment zone(s); hammer energies required for pile installation and the number of strikes per pile; the hydrophone equipment and methods (*i.e.,* recording device, bandwidth/sampling rate; distance from the pile where recordings were made; the depth of recording device(s)); a description of the SFV measurement hardware and software, including software version used, calibration data, bandwidth capability and sensitivity of hydrophone(s), any filters used in hardware or software, any limitations with the equipment, and other relevant information; the spatial configuration of the noise attenuation device(s) relative to the pile; a description of the noise abatement system and operational parameters (*e.g.,* bubble flow rate, distance deployed from the pile, *etc.*), and any action taken to adjust the noise abatement system. A discussion which includes any observations which are suspected to have a significant impact on the results including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, and technical issues with hydrophones or recording devices;

(12) If at any time during the project LOA Holder becomes aware of any issue or issues which may (to any reasonable subject-matter expert, including the persons performing the measurements and analysis) call into question the validity of any measured Level A harassment or Level B harassment isopleths to a significant degree, which were previously transmitted or communicated to NMFS Office of Protected Resources, LOA Holder must inform NMFS Office of Protected Resources within 1 business day of becoming aware of this issue or before the next pile is driven, whichever comes first;

(13) If a North Atlantic right whale is acoustically detected at any time by a project-related PAM system, LOA Holder must ensure the detection is reported as soon as possible to NMFS, but no longer than 24 hours after the detection via the *24-hour North Atlantic right whale Detection Template* (*https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates*). Calling the hotline is not necessary when reporting PAM detections via the template;

(14) Full detection data, metadata, and location of recorders (or GPS tracks, if applicable) from all real-time hydrophones used for monitoring during construction must be submitted within 90 calendar days following completion of activities requiring PAM for mitigation via the International Organization for Standardization (ISO) standard metadata forms available on the NMFS Passive Acoustic Reporting System website *(https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates*). Submit the completed data templates to *nmfs.nec.pacmdata@noaa.gov.* The full acoustic recordings from real-time systems must also be sent to the National Centers for Environmental Information (NCEI) for archiving within 90 days following completion of activities requiring PAM for mitigation. Submission details can be found at: *https://www.ncei.noaa.gov/products/passive-acoustic-data;*

(15) LOA Holder must submit situational reports if the following circumstances occur, including all instances wherein an exemption is taken must be reported to NMFS Office of Protected Resources within 24 hours, in specific circumstances, including but not limited to the following:

(i) If a North Atlantic right whale is observed at any time by PSOs or project personnel, LOA Holder must ensure the sighting is immediately (if not feasible, as soon as possible and no longer than 24 hours after the sighting) reported to NMFS, the U.S. Coast Guard, and the Right Whale Sightings Advisory System (RWSAS). If in the Northeast Region (Maine to Virginia/North Carolina border) call (866–755–6622). If in the Southeast Region (North Carolina to Florida) call (877–WHALE–HELP or 877–942–5343). If circumstances arise where calling NMFS is not possible, reports must be made to the U.S. Coast Guard via channel 16 or through the WhaleAlert app (*http://www.whalealert.org/*). The sighting report must include the time, date, and location of the sighting, number of whales, animal description/certainty of sighting (provide photos/video if taken), Lease Area/project name, PSO/personnel name, PSO provider company (if applicable), and reporter's contact information.

(ii) If a North Atlantic right whale is observed at any time by PSOs or project personnel, LOA Holder must submit a summary report to NMFS Greater Atlantic Regional Fisheries (GARFO; *nmfs.gar.incidental-take@noaa.gov*), NMFS Office of Protected Resources,

and NMFS Northeast Fisheries Science Center (NEFSC; *ne.rw.survey@noaa.gov*) within 24 hours with the above information and the vessel/platform from which the sighting was made, activity the vessel/platform was engaged in at time of sighting, project construction and/or survey activity at the time of the sighting (*e.g.,* pile driving, cable installation, HRG survey), distance from vessel/platform to sighting at time of detection, and any mitigation actions taken in response to the sighting;

(iii) If a large whale other than a North Atlantic right whale is observed at any time by PSOs or project personnel, LOA Holder must report the sighting to the WhaleAlert app (*http://www.whalealert.org/*);

(iv) In the event that personnel involved in the Project discover a stranded, entangled, injured, or dead marine mammal, LOA Holder must immediately report the observation to NMFS. If in the Greater Atlantic Region (Maine to Virginia) call the NMFS Greater Atlantic Stranding Hotline (866–755–6622); if in the Southeast Region (North Carolina to Florida), call the NMFS Southeast Stranding Hotline (877–942–5343). Separately, LOA Holder must report the incident to NMFS Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov*); if in the Greater Atlantic region (Maine to Virginia), to NMFS Greater Atlantic Regional Fisheries Office (GARFO; *nmfs.gar.incidental-take@noaa.gov, nmfs.gar.stranding@noaa.gov*); if in the Southeast region (North Carolina to Florida), to NMFS Southeast Regional Office (SERO; *secmammalreports@noaa.gov*); and to the U.S. Coast Guard, as soon as feasible but within 24-hours. The report (via phone or email) must include contact (name, phone number, *etc.*), the time, date, and location 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; and

(v) In the event of a vessel strike of a marine mammal by any vessel associated with the Project or if project activities cause a non-auditory injury or death of a marine mammal, LOA Holder must immediately report the incident to NMFS. If in the Greater Atlantic Region (Maine to Virginia) call the NMFS Greater Atlantic Stranding Hotline (866–755–6622) and if in the Southeast Region (North Carolina to Florida) call the NMFS Southeast Stranding Hotline (877–942–5343). Separately, LOA Holder must immediately report the incident to NMFS Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov*) and, if in the Greater Atlantic region (Maine to Virginia), NMFS GARFO (*nmfs.gar.incidental-take@noaa.gov, nmfs.gar.stranding@noaa.gov*) or, if in the Southeast region (North Carolina to Florida), NMFS SERO (*secmammalreports@noaa.gov*). The report must include the time, date, and location of the incident; species identification (if known) or description of the animal(s) involved; vessel size and motor configuration (inboard, outboard, jet propulsion); vessel's speed leading up to and during the incident; vessel's course/heading and what operations were being conducted (if applicable); 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). LOA Holder must immediately cease all on-water activities until the NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. LOA Holder may not resume their activities until notified by NMFS Office of Protected Resources; and

(16) Any lost gear associated with the fishery surveys will be reported to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division (*nmfs.gar.incidentaltake@noaa.gov*) as soon as possible or within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear. All reasonable efforts, that do not compromise human safety, must be undertaken to recover gear.

§ 217.296 Letter of Authorization.

(a) To incidentally take marine mammals pursuant to this subpart, LOA Holder must apply for and obtain an LOA.

(b) An LOA, unless suspended or revoked, may be effective for a period of time not to exceed February 4, 2029, the expiration date of this subpart.

(c) In the event of projected changes to the activity or to mitigation and monitoring measures required by an LOA, LOA Holder must apply for and obtain a modification of the LOA as described in § 217.297.

(d) The LOA must set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact (*i.e.,* mitigation) on the species, its habitat, and on the availability of the species for subsistence uses; and

(3) Requirements for monitoring and reporting.

(e) Issuance of the LOA must be based on a determination that the level of taking must be consistent with the findings made for the total taking allowable under the regulations of this subpart.

(f) Notice of issuance or denial of an LOA must be published in the **Federal Register** within 30 days of a determination.

§ 217.297 Modifications of Letter of Authorization.

(a) An LOA issued under §§ 217.292 and 217.296 or this section for the activities identified in § 217.290(a) shall be modified upon request by LOA Holder, provided that:

(1) The specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for this subpart (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section); and

(2) NMFS determines that the mitigation, monitoring, and reporting measures required by the previous LOA under this subpart were implemented.

(b) For a LOA modification request by the applicant that includes changes to the activity or the mitigation, monitoring, or reporting (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section), the LOA shall be modified, provided that:

(1) NMFS determines that the changes to the activity or the mitigation, monitoring, or reporting do not change the findings made for the regulations in this subpart and do not result in more than a minor change in the total estimated number of takes (or distribution by species or years), and

(2) NMFS may publish a notice of proposed modified LOA in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the LOA.

(c) An LOA issued under §§ 217.292 and 217.296 or this section for the activities identified in § 217.290(a) may be modified by NMFS under the following circumstances:

(1) Through adaptive management, NMFS may modify (including delete, modify, or add to) the existing mitigation, monitoring, or reporting measures (after consulting with LOA Holder regarding the practicability of the modifications), if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring;

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in an LOA include, but are not limited to:

(A) Results from LOA Holder's monitoring(s);

(B) Results from other marine mammals and/or sound research or studies; and

(C) Any information that reveals marine mammals may have been taken in a manner, extent, or number not authorized by the regulations in this subpart or subsequent LOA.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS shall publish a notice of proposed LOA in the **Federal Register** and solicit public comment.

(2) If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in the LOA issued pursuant to §§ 217.292 and 217.296 or this section, an LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within 30 days of the action.

§§ 217.298–217.299 [Reserved]

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