Appendix H
Mitigation and Monitoring

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Abbreviations and Acronyms

AIS	automatic identification system
applicant	Park City Wind LLC
ASR	airport surveillance radar
BO	Biological Opinion
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
COP	Construction And Operations Plan
CR	Conservation Recommendation
CZM	Office of Coastal Zone Management
dB	decibel
DMA	dynamic management area
DTS	distributed temperature sensing
EIS	environmental impact statement
EFH	essential fish habitat
ESA	Endangered Species Act
ESP	electrical service platform
FL	Florida
GARFO	Greater Atlantic Regional Fisheries Office
HAPC	habitat area of particular concern
HDD	horizontal directional drilling
HESD	Habitat and Ecosystem Services Division
HH:MM	hour:minute
HRG	high-resolution geophysical
Hz	hertz
ID	identification
ISO	International Organization for Standardization
ITA	Incidental Take Authorization
ITS	Incidental Take Statement
kHz	kilohertz
kJ	kilojoule
LOA	Letter of Authorization
m/s	meters per second
MassDEP	Massachusetts Department of Environmental Protection
ME	Maine
MEC	munitions and explosives of concern
MMPA	Marine Mammal Protection Act
NA	not applicable
NARW	North Atlantic right whale
NAS	noise attenuation system
NC	North Carolina
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NHESP	Natural Heritage and Endangered Species Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
OECC	offshore export cable corridor
OPR	Office of Protected Resources
PAM	passive acoustic monitoring
PATON	private aid to navigation

PPPP	Piping Plover Project Plan
Project	New England Wind Project
PSO	protected species observer
ROD	Record of Decision
RPM	Reasonable and Prudent Measure
SAR	search and rescue
SAV	submerged aquatic vegetation
SBM	subbottom profiler
SEL	sound exposure level
SELss	single strike sound exposure level
SFV	sound field verification
SMA	seasonal management area
SPL	sound pressure level
SPLpk	peak sound pressure level
SPLrms	root-mean-square sound pressure level
SWDA	Southern Wind Development Area
TMP	traffic management plan
TSHD	trailing suction hopper dredge
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
UTC	Universal Time Coordinated
UXO	unexploded ordnance
VA	Virginia
VHF	very high frequency
Vineyard Wind 1	Vineyard Wind 1 Project
WTG	wind turbine generator
Y/N	yes/no
YY-MM-DDT	Year-Month-Day Time Zone
YYYY-MM-DD	Year-Month-Day

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H Mitigation and Monitoring

As part of the proposed New England Wind Project (proposed Project), Park City Wind LLC (applicant) has voluntarily committed to measures to avoid, reduce, otherwise mitigate, or monitor[1] impacts (mitigation and monitoring measures) on the resources discussed in Chapter 3, Affected Environment and Environmental Consequences, and Appendix G, Impact-Producing Factor Tables and Assessment of Resources with Minor (or Lower) Impacts, the Final Environmental Impact Statement (EIS). The mitigation and monitoring measures that the applicant has committed to implement are summarized in the Construction and Operations Plan (COP) (Volume III, Section 4; Epsilon 2023).

The Bureau of Ocean Energy Management (BOEM) considers as part of the Proposed Action only those mitigation and monitoring measures that the applicant has committed to in the COP. BOEM may select alternatives or require additional mitigation or monitoring measures as a condition of COP approval to further protect and monitor these resources. Additional potential mitigation and monitoring measures have been developed through reviews under several environmental statutes (National Historic Preservation Act, Magnuson-Stevens Fisheries Conservation and Management Act, Endangered Species Act [ESA], and Marine Mammal Protection Act), as discussed in EIS Appendix A, Required Environmental Permits and Consultations. The mitigation and monitoring measures that the applicant has committed to implement (including and in addition to those defined in the COP) are listed in Table H-1. Mitigation and monitoring measures that may result from reviews under the statutes listed above are shown in Table H-2. Some of these mitigation and monitoring measures are outside of BOEM's statutory and regulatory authority but could potentially be adopted and imposed by other governmental entities. Tables H-1 and H-2 provide descriptions of mitigation or monitoring measures, along with the resource or resources to which each measure applies.

If the COP is approved or approved with conditions, it will include mitigation and monitoring measures developed under various consultations and permit reviews (e.g., ESA and Marine Mammal Protection Act) and adopted by the Final EIS Record of Decision (ROD). If BOEM approves the COP, the ROD will state which of the additional mitigation and monitoring measures in Tables H-1 and H-2 have been adopted. Any mitigation measures analyzed in the impact analysis of the selected alternative, and that influenced the impact determinations under that alternative, will be adopted. The applicant will be required to implement the mitigation and monitoring measures applicable that are adopted in the ROD (Code of Federal Regulations, Title 40, Section 1505.3 [40 CFR § 1505.3]), and it will be required to certify compliance with certain terms and conditions as required under 30 CFR § 585.633(b).

[1] According to the Council on Environmental Quality, monitoring is "fundamental for ensuring the implementation and effectiveness of mitigation commitments, meeting legal and permitting requirements, and identifying trends and possible means for improvement" (CEQ 2011).

Actions may be required to evaluate the effectiveness of a mitigation and monitoring measure or to identify if resources are responding as predicted to impacts from the proposed Project. The applicant may be required to develop additional monitoring programs in coordination with BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to (1) adapt how a mitigation and monitoring measure identified in the COP or ROD is being implemented, (2) develop or modify future mitigation and monitoring measures for the decommissioning of the proposed Project or for all stages of future projects, and/or (3) contribute to regional efforts intended to gain a better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic. Unless specified, the proposed mitigation and monitoring measures described below would not change the impact ratings on the affected resource, as described in EIS Chapter 3 and Appendix G, but would reduce expected impacts or inform the development of addition mitigation and monitoring measures if required.

Table H-1: Applicant-Proposed Mitigation Measures and Monitoring Efforts Analyzed

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
1.	Construction Management Plan	The applicant will prepare and implement a construction management plan that will be used by the applicant and its contractors during construction. The construction management plan will be an integral part of the applicant's effort to ensure that environmental protection and sound construction practices are implemented.	All resources
2.	Dust control plans for onshore construction and laydown areas	The applicant will develop dust control plans for onshore construction areas to minimize impacts from fugitive dust resulting from construction activities.	Air Quality (G.2.1)
3.	Use of low-sulfur fuels	Proposed Project engines and generators will use low-sulfur fuels and meet or emit less than the applicable on-road, non-road, and marine engine emission standards.	Air Quality (G.2.1)
4.	Emissions control technology	Emissions from Outer Continental Shelf sources will meet applicable Massachusetts Best Available Control Technology and Lowest Achievable Emission Rate limits.	Air Quality (G.2.1)
5.	Emissions offsets	The applicant will offset applicable nitrogen oxides and volatile organic compound emissions by acquiring emissions offsets or other means acceptable to the U.S. Environmental Protection Agency.	Air Quality (G.2.1)
6.	Vehicle Fueling	The applicant will prohibit field refueling of vehicles within 100 feet (30 meters) of wetlands or waterways or known private or community potable wells or within any Town of Barnstable water supply Zone I area.	Water Quality (G.2.2)
7.	Spill response	Proper spill containment gear and absorption materials will be maintained for immediate use in the event of any inadvertent spills or leaks. Any onshore substation equipment will be equipped with full containment for any components containing dielectric fluid.	Water Quality (G.2.2)
8.	Avian and bat post-construction monitoring program	The applicant will develop and implement a framework for an avian and bat post-construction monitoring program. The applicant expects to model the framework for the proposed Project on the framework developed for the Vineyard Wind 1 Project (Vineyard Wind 1); therefore, the framework for the proposed Project will include, at a minimum: • Acoustic monitoring for birds and bats; • Installation of Motus receivers on WTGs in the SWDA and support with upgrades or maintenance of two onshore Motus receivers; • Deployment of up to 150 Motus tags per year for up to 3 years to track Roseate Terns (*Sterna dougallii*), Common Terns (*Sterna hirundo*), and/or nocturnal passerine migrants; • Pre- and post-construction boat surveys; • Avian behavior point count surveys at individual WTGs; and • Annual monitoring reports that will be used to assess the need for reasonable revisions (based on subject matter expert analysis) to the monitoring plan and may include new technologies as they become available for use in offshore environments. The applicant will work with BOEM to ensure the data is publicly available.	Bats (G.2.3); Birds (G.2.4)
9.	Aircraft detection lighting system	The applicant has committed to use Federal Aviation Administration -approved aircraft detection lighting system, which will only activate the Federal Aviation Administration hazard lighting when an aircraft is in the vicinity of the wind facility to reduce the visibility of nighttime lighting and, thus, reduce nighttime visual impacts.	Bats (G.2.3); Birds (G.2.4); Cultural Resources (3.10); Recreation and Tourism (3.15); Scenic and Visual Resources (3.16)
10.	Benthic monitoring framework	The applicant will develop a benthic monitoring framework in consultation with BOEM and other agencies as appropriate (COP Appendix III-U; Epsilon 2023), based on the framework prepared for Vineyard Wind 1.	Benthic Resources (3.4)
11.	Sensitive habitat avoidance	Offshore export cable installation will avoid important habitats and those considered habitats areas of particular concern, such as eelgrass beds and hard-bottom sediments, if feasible. The applicant expects to avoid the identified eelgrass resources near Spindle Rock in proximity to the Phase 1 landfall sites, as well as isolated areas of hard bottom may be avoided, such as at Spindle Rock.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5); Finfish, Invertebrates, and Essential Fish Habitat (3.6)
12.	Mid-line anchor buoys	Where feasible and considered safe, vessels deploying anchors will use mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5); Finfish, Invertebrates, and Essential Fish Habitat (3.6)
13.	Anti-perching	In accordance with safety and engineering requirements, the applicant will consider installing anti-perching devices on WTGs and ESP(s), where and if appropriate, to reduce potential bird perching locations.	Birds (G.2.4)
14.	Bird mortality monitoring	Using a standardized protocol for the proposed Project, the applicant will document any dead or injured birds found on vessels and structures during construction, operations, and decommissioning.	Birds (G.2.4)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
15.	Piping Plover Protection Plan	The applicant has developed a PPPP for the Phase 1 landfall sites and expects to develop a similar plan for the Phase 2 landfall sites (COP Appendix III-R; Epsilon 2023). The applicant expects that activities at the landfall sites will not occur between April 1 and August 31 to avoid and minimize noise impacts on Piping Plover (*Charadrius melodus*) during the breeding season.	Birds (G.2.4)
16.	Piping Plover Protection Plan, HDD Provisions	Prior to HDD operations, construction personnel will be provided with the PPPP to achieve proper implementation. The PPPP includes (at minimum) the following provisions: • Installation of export cable conduits is not expected to be initiated between April 1 and August 31. If HDD activities are initiated between April 1 and August 31, or if work is re-initiated after a 48-hour work stoppage during the Piping Plover nesting season (the aforementioned time period), the Massachusetts NHESP, the U.S. Fish and Wildlife Service, and BOEM must be notified with the reason, anticipated duration of the work, and any additional information requested by NHESP, the U.S. Fish and Wildlife Service, and BOEM. • In the unlikely event that disturbance associated with HDD activities to coastal beach occurs, a qualified biologist will survey the site in advance of any equipment access to the beach and ensure no remedial actions will interfere with nesting Piping Plovers or other state-listed species.	Birds (G.2.4)
17.	Piping Plover Protection Plan (pre-construction monitoring)	If HDD activities are initiated between April 1 and August 31, or if work is re-initiated after a 48-hour work stoppage during the Piping Plover nesting season (the aforementioned time period), the applicant will follow the mitigation and monitoring measures outlined in the PPPP. As depicted in the PPPP, a qualified biologist will perform surveys to determine the presence/absence of any nesting Piping Plovers within 200 yards of the work zone. If no nests, scrapes, or territorial pairs are identified within 200 yards of the work zone, the shorebird monitor will document the findings, report to NHESP and the applicant, and the applicant will be cleared to mobilize into the area within 48 hours, with no further monitoring activities required. If nests, scrapes, or territorial pairs are observed within 200 yards of the work zone, locations will be recorded and the following monitoring will be required, based on nests and/or chick proximity to the work zone: • Greater than or equal to 100 yards from work zone and nest monitored once per day at dawn (before 0600 hours) during appropriate weather conditions; • 50 to 100 yards from work zone and nest monitored twice per day at dawn and dusk (before 0600 hours and after 1900 hours) during appropriate weather conditions; and • Less than 50 yards to the work zone and no equipment may be mobilized to the OECC landing sites unless specifically permitted by the NHESP.	Birds (G.2.4)
18.	Sensitive habitat map distribution	Prior to the start of construction, the applicant will provide contractors with a map of sensitive habitats to allow them to plan their mooring positions accordingly. Vessel anchors and legs will be required to avoid known eelgrass beds and other sensitive seafloor habitats (hard/complex bottom), as long as such avoidance does not compromise the vessel's safety or the cable's installation. Where it is considered impossible or impracticable to avoid a sensitive seafloor habitat when anchoring, use of mid-line anchor buoys will be considered, where feasible and considered safe, as a potential measure to reduce and minimize potential impacts from anchor line sweep.	Coastal Habitats and Fauna (3.5)
19.	Oil spill response plan	The applicant will develop an oil spill response plan (COP Appendix I-F; Epsilon 2023).	Coastal Habitats and Fauna (3.5); Water Quality (G.2.2)
20.	Construction lighting reduction	During construction and operations, the applicant will reduce lighting to the extent practicable and down-shield lighting or use down-lighting.	Coastal Habitats and Fauna (3.5); Bats (G.2.3); Birds (G.2.4)
21.	Pre-construction, construction, and post-construction fisheries surveys	The applicant is collecting pre-construction fisheries data in cooperation with University of Massachusetts Dartmouth School of Marine Science and Technology via trawl and drop camera surveys within the SWDA and OECC. The applicant will develop a framework for construction and post-construction fisheries studies within the SWDA and OECC, in coordination with other offshore wind energy developers in the Rhode Island and Massachusetts Lease Areas. All pre-construction, construction, and post-construction survey and monitoring work will be publicly available. The applicant will work with the Responsible Offshore Science Alliance and the Regional Wildlife Science Entity to help streamline and standardize available data across all offshore efforts.	Finfish, Invertebrates, and Essential Fish Habitat (3.6)
22.	Pile driving soft start	The applicant will apply a soft-start procedure to the pile-driving process, in which the pile-driving process includes an initial set of three strikes from the impact hammer at reduced energy, followed by a 1-minute waiting period. This process will be repeated a total of three times prior to initiation of pile driving. Soft start will occur for all impact driving, including at the beginning of the day, and at any time following a cessation of impact pile driving of 30 minutes or longer.	Finfish, Invertebrates, and Essential Fish Habitat (3.6); Marine Mammals (3.7); Sea Turtles (3.8)
23.	Offshore Wind Protected Marine Species Mitigation Fund	The applicant will establish an Offshore Wind Protected Marine Species Mitigation Fund as part of Phase 1. The applicant has committed to provide up to $2.5 million to the Mystic Aquarium in Connecticut to continue evolving the understanding of underwater noise generated by offshore wind farms and the potential impacts on cetacean and pinniped behavior, hearing, and physiology. In addition, this fund will further the investigation of best practices and advance technologies to reduce potential sound impacts and collision threats from offshore wind project development.	Finfish, Invertebrates, and Essential Fish Habitat (3.6); Marine Mammals (3.7); Sea Turtles (3.8)
24.	Pile-driving time-of-year restriction	No pile-driving activities will occur from January 1 to April 30.	Finfish, Invertebrates, and Essential Fish Habitat (3.6); Marine Mammals (3.7); Sea Turtles (3.8)
25.	Pile-driving noise attenuation	The applicant will implement noise attenuation mitigation to reduce sound levels by a target of approximately 12 dB or greater. Sound source verification monitoring, such as with PAM devices, will be used to verify the level of noise attenuation achieved by noise abatement methods.	Finfish, Invertebrates, and Essential Fish Habitat (3.6); Marine Mammals (3.7); Sea Turtles (3.8)

<table>
<tr><th>Measure Number</th><th>Measure Title</th><th>Measure Description</th><th>Resource Area Addressed (EIS Section)</th></tr>
<tr><td>26.</td><td>Visual and PAM monitoring during UXO detonations (vessel-based)</td><td>Two PSOs will visually survey the UXO clearance zone at least 60 minutes prior to a detonation event, during the event, and for 30 minutes after the event. PAM monitoring will be conducted during UXO detonations and will begin at least 60 minutes prior to UXO detonations and extend at least 30 minutes after the event.</td><td>Marine Mammals (3.7); Sea Turtles (3.8)</td></tr>
<tr><td>27.</td><td>Time -of-day restrictions for UXO detonations</td><td>No UXO will be detonated during nighttime hours and only one detonation may occur in a 24-hour period.</td><td>Marine Mammals (3.7); Sea Turtles (3.8)</td></tr>
<tr><td>28.</td><td>Pre-start clearance for UXO detonations</td><td>A 60-minute pre-start clearance period will be implemented prior to any in-situ UXO detonations. The clearance zone must be fully visible for at least 30 minutes prior to commencing detonation. All marine mammals must be confirmed to be out of the clearance zone prior to initiating detonation. If a marine mammal is observed entering or within the relevant clearance zones prior to the initiation of detonation, the detonation must be delayed. The detonation may commence when either the marine mammal(s) has voluntarily left the respective clearance zone and been visually confirmed beyond that clearance zone, or when 30 minutes have elapsed without redetection for whales, including the NARW (Eubalaena glacialis), or when15 minutes have elapsed without redetection of dolphins, porpoises, and seals.</td><td>Marine Mammals (3.7); Sea Turtles (3.8)</td></tr>
<tr><td>29.</td><td>UXO clearance zones</td><td>The clearance zones for a UXO detonation are provided below (JASCO 2023):
<table>
<tr><th>Hearing Group</th><th>UXO Visual and PAM Clearance Zone (meters)</th><th>UXO PAM Zones (meters)</th></tr>
<tr><td>Low-frequency cetacean</td><td>3,800</td><td>11,900</td></tr>
<tr><td>Mid-frequency cetacean</td><td>650</td><td>2,550</td></tr>
<tr><td>High-frequency cetacean</td><td>6,200</td><td>14,100</td></tr>
<tr><td>Phocid pinniped in water</td><td>1,600</td><td>7,020</td></tr>
</table></td><td>Marine Mammals (3.7); Sea Turtles (3.8)</td></tr>
<tr><td>30.</td><td>Noise attenuation for UXO detonations</td><td>The applicant will use a dual noise mitigation system for all detonation events and is committed to achieving the modeled ranges associated with 10 dB of noise attenuation.</td><td>Marine Mammals (3.7); Sea Turtles (3.8)</td></tr>
<tr><td>31.</td><td>Work zones</td><td>The applicant will use expanded work zones and construction staging areas where required to accommodate special construction equipment and materials. Wherever possible, these spaces will be located within previously developed areas, such as nearby parking lots, to avoid or minimize disturbance to naturally vegetated areas. Any previously undisturbed areas of wildlife habitat affected by expanded work zones or elsewhere along the onshore export cable routes and grid interconnection routes will be restored in consultation with local officials. For construction within utility right-of-way, any disturbed vegetated areas will be loamed and seeded to match pre-existing vegetation.</td><td>Terrestrial Habitats and Fauna (G.2.5); Land Use and Coastal Infrastructure (G.2.7)</td></tr>
<tr><td>32.</td><td>Offshore markings and coordination</td><td>To minimize hazards to navigation, all proposed Project-related vessels and equipment will display the required marine navigation lighting and day shapes.
The applicant will issue Offshore Wind Mariner Update Bulletins and coordinate with the USCG to provide Notices to Mariners to notify recreational and commercial vessels of their intended operations within the offshore development area.
The applicant is currently providing and will continue to provide portable digital media with electronic charts depicting locations of proposed Project-related activities.</td><td>Commercial Fisheries and For-Hire Recreational Fishing (3.9); Navigation and Vessel Traffic (3.13); Recreation and Tourism (3.15)</td></tr>
<tr><td>33.</td><td>Aids to navigation</td><td>Each proposed Project WTG and ESP will be maintained as a private aid to navigation in accordance with USCG’s private aid to navigation marking guidance for offshore wind facilities.
The applicant will implement a uniform system of marine navigation lighting and marking for the offshore facilities, which is currently expected to include yellow flashing lights on every WTG foundation and ESP; unique alphanumeric identifiers on the WTGs, ESPs, and/or their foundations; and high-visibility yellow paint on each foundation.
Mariner radio activated sound system and automatic identification system transponders are included in the offshore facilities’ design to enhance marine navigation safety. Each WTG and ESP will also be clearly identified on navigation charts.</td><td>Commercial Fisheries and For-Hire Recreational Fishing (3.9); Navigation and Vessel Traffic (3.13); Recreation and Tourism (3.15)</td></tr>
<tr><td>34.</td><td>Marine coordination</td><td>The applicant will employ a Marine Operations Liaison Officer, who will be responsible for safe marine operations. The applicant will also employ a Marine Coordinator during proposed Project construction to coordinate with maritime partners and stakeholders (e.g., the USCG, U.S. Navy, port authorities, state and local law enforcement, marine patrol, commercial operators, etc.).</td><td>Commercial Fisheries and For-Hire Recreational Fishing (3.9); Navigation and Vessel Traffic (3.13); Recreation and Tourism (3.15)</td></tr>
<tr><td>35.</td><td>Funding for fisheries research and education</td><td>As part of Phase 1, the applicant has committed to provide up to $2.5 million to support fisheries research and education as part of a new initiative launched by the University of Connecticut to improve the understanding of potential environmental impacts from offshore wind.
Additionally, as part of Phase 1, the applicant will allocate up to $7.5 million in funds to support environmental initiatives, assist Connecticut fishermen, and further bolster local communities in Connecticut where offshore wind development activities are taking place.</td><td>Commercial Fisheries and For-Hire Recreational Fishing (3.9); Demographics, Employment, and Economics (3.11); Environmental Justice (3.12)</td></tr>
<tr><td>36.</td><td>Avoid identified shipwrecks, debris</td><td>The applicant is required to avoid the shipwrecks, potentially significant debris fields, and as many as possible of the submerged, landform features identified during marine archaeological surveys of the SWDA and OECC. While avoidance of shipwrecks and debris fields is typically simple, avoidance of all submerged landform features is typically not possible due to their size and orientation.</td><td>Cultural Resources (3.10)</td></tr>
</table>

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
	fields, and submerged landform features that can be avoided		
37.	Gay Head Lighthouse repair funds	The applicant will contribute up to $150,000 each for Phase 1 and Phase 2 to fund ongoing maintenance and repair work at the Gay Head Lighthouse. Such work may include, but is not limited to, the repair of exterior metalwork including the lantern curtain wall, kick plate, cast iron sills, railings, stanchions, stiles, and other metalwork. Additionally, such work may include repair and repointing of the structure to secure the envelope and reduce potential water infiltration.	Cultural Resources (3.10)
38.	Vineyard Sound and Moshup's Bridge traditional cultural property mitigation fund	Pursuant to consultations between the applicant and the Wampanoag Tribe of Gay Head (Aquinnah), the applicant will contribute up to $150,000 each for Phase 1 and Phase 2 to support public education purposes on Moshup and Moshup's Bridge. The applicant will consult with the tribe to determine the most appropriate use of the funds and the scope of work.	Cultural Resources (3.10)
39.	Apply no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey Paint Color to the turbines	The applicant is required to paint the WTGs off-white/light grey (no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey) to reduce visual impacts during daylight hours on historic properties. The applicant has already committed to this measure as part of the National Historic Preservation Act Section 106 process.	Cultural Resources (3.10); Recreation and Tourism (3.15); Visual Resources (3.16)
40.	Fisheries communication plan	Prior to the start of offshore export cable-laying preparatory activities for either phase, the applicant will communicate with commercial fishermen following the protocols outlined in the fisheries communication plan provided in the COP (Appendix III-E; Epsilon 2023) to help avoid potential fishing gear interactions.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Demographics, Employment, and Economics (3.11)
41.	Direct support for economic and community initiatives	During Phase 1, the applicant has committed $26.5 million (nominal) to support the economic and community initiatives such as supply chain integration, workforce development, and offshore wind-related marine and fisheries research, as well as the local communities in Connecticut. The applicant also expects to develop additional community and environmental initiatives in connection with its efforts to secure long-term contracts/power purchase agreements for the electricity generated by Phase 2.	Demographics, Employment, and Economics (3.11); Environmental Justice (3.12)
42.	TMP	Prior to construction, the applicant will work with the Town of Barnstable to develop a TMP for the onshore construction of each proposed Project phase. The TMP will be a living document such that any unanticipated change in construction location, timing, or method previously identified will result in revision of the TMP and approval by the appropriate authorities before any construction changes are implemented. The applicant will restore paved areas at landfall sites and repave roads in accordance with Massachusetts Department of Transportation and Town specifications to as-new conditions and restore disturbed vegetated areas to match pre-existing vegetation.	Demographics, Employment, and Economics (3.11); Land Use and Coastal Infrastructure (G.2.7)
43.	Onshore construction public outreach	The applicant will use various methods of public outreach prior to and during construction to keep residents, business owners, and officials updated on the construction schedules, vehicular access, lane closures, detours, other traffic management information, local parking availability, emergency vehicle access, construction crew movement and parking, laydown areas, staging, equipment delivery, nighttime or weekend construction, and road repaving.	Demographics, Employment, and Economics (3.11); Land Use and Coastal Infrastructure (G.2.7)
44.	Onshore cable installation restrictions	The applicant will generally limit installation of onshore duct bank and cables, and construction is anticipated to occur during typical work hours (7:00 a.m. to 6:00 p.m.) Monday through Friday. For some specific instances at some locations, or at the request of the Barnstable Department of Public Works, the applicant may seek municipal approval to work at night or on weekends. Nighttime work will be minimized and performed only on an as-needed basis, such as when crossing a busy road, and will be coordinated with the Town of Barnstable. The applicant will avoid construction activities at the landfall sites and along the onshore export cable route and grid interconnection routes (particularly where the routes follow public roadway layouts) will also likely be subject to significant construction limitations from Memorial Day through Labor Day unless authorized by Barnstable but could extend through June 15 subject to consent from the Department of Public Works. The applicant will consult with the Town of Barnstable regarding the construction schedule.	Land Use and Coastal Infrastructure (G.2.7); Recreation and Tourism (3.15)
45.	Visual screening of substation sites	For the Phase 1 onshore substation, the applicant will plant a vegetated screen on the western and northern boundaries of the onshore substation site; the vegetated screening along the western edge will provide visual screening for existing residences. For Phase 2, depending on the onshore substation site(s) selected, the applicant may plant vegetated screening to provide visual screening for existing residences.	Land Use and Coastal Infrastructure (G.2.7); Scenic and Visual Resources (3.16)
46.	WTG shutdown mechanism	All WTG rotors (blade assemblies) will have control mechanisms operable from the applicant control centers available 24 hours per day, 7 days per week. The control mechanisms will enable control room operators to shut down the requested WTGs within an agreed upon time of notification between the USCG and the applicant. A formal shutdown procedure will be part of the standard operating procedures and periodically tested. Normally, USCG-ordered shutdowns will be limited to those WTGs in the immediate vicinity of an emergency and for as short a period as is safely practicable under the circumstances, as determined by the USCG.	Navigation and Vessel Traffic (3.13)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
Proposed Mitigation, Monitoring, and Reporting Measures in the MMPA Letter of Authorization Application[a]			
47.	Seasonal Restrictions on Pile Driving Activities	Historical and anticipated NARW presence will be used to inform a time of year restriction on pile driving that will minimize the amount of pile driving that occurs when the migratory NARW is likely to be in the Offshore Development Area and will thus limit sound exposure for this endangered species. The applicant expects to establish a restriction on pile driving activities (i.e., impact pile driving, vibratory driving, and drilling) between January 1 and April 30. The seasonal restriction would also have a protective effect for other marine mammal species. There is no seasonal restriction applied to HRG surveys and potential detonation of UXO.	Marine Mammals (3.7)
48.	NAS	Several hypothetical broadband attenuation levels (0, 10, and 12 dB) were included in the modeling of impact pile driving for comparison purposes. When calculating takes from impact pile driving, impacts to marine mammals were conservatively assessed based on 10 dB of noise attenuation. However, the applicant expects to implement noise attenuation technology to reduce sound levels by a target of 12 dB or greater, so exposure and range estimates for this activity show both values for comparison. Pile driving sound attenuation technology under consideration for the project includes piling equipment that is optimized for sound reduction (e.g., Integrated Pile Installer), underwater noise abatement systems (e.g., AdBm Technologies encapsulated bubble sleeve), and/or bubble curtains. The applicant will use two NASs during pile driving (e.g., two bubble curtains, one bubble curtain and one AdBm Technologies encapsulated bubble sleeve, etc.) for monopile installation and up to two NASs for jacket installation. The applicant will also use NAS for all UXO detonation events and is committed to achieving a minimum of 10 dB of attenuation. Although the take request only reflects estimates assuming NAS during impact pile driving and potential detonation of UXO, the applicant also intends to use NAS during all vibratory driving and drilling activity.	Marine Mammals (3.7)
49.	Establishment of Protective Zones during Pile Driving: Impact Pile Driving	The applicant's proposed clearance and shutdown zones are discussed in 11.3.1 of the LOA application, and the proposed clearance and shutdown zones for marine mammals are provided in Tables 65 and 66 of the LOA application. The proposed visual clearance and shutdown zones and PAM clearance and shutdown zones are provided in Table 67 of the LOA application (JASCO 2022).	Marine Mammals (3.7)
50.	Establishment of Protective Zones during Vibratory Setting and Drilling	Protective zones have also been established for vibratory setting and drilling activity during pile installation. The species-specific shutdown and clearance zones for vibratory setting and drilling activity are provided in Table 68 of the LOA application (JASCO 2022). Mitigation zones implemented during construction activity may be modified, with NMFS approval, based on received sound level measurements during piling operations.	Marine Mammals (3.7)
51.	Establishment of Protective Zones during UXO detonation	Protective zones will be established to minimize and avoid potential impacts of underwater sound to marine mammals during UXO detonation. The proposed visual and PAM clearance zones as well as ranges to temporary threshold shift onset thresholds for marine mammal hearing groups are provided in Table 69 of the LOA application (JASCO 2022).	Marine Mammals (3.7)
52.	Establishment of Protective Zones during HRG Surveys	Visual and acoustic monitoring of clearance and shutdown zones during pile driving and HRG surveys will be conducted by NMFS-approved PSOs, and the final requirements and data sharing will be determined in collaboration with BOEM and NOAA Fisheries. Clearance Zone • Clearance zones will be monitored around the center of the acoustic sources for marine mammals. • Clearance zones will be monitored for all listed species for 30 minutes to ensure that no marine mammals are present before any compressed high-intensity radiated pulse subbottom profilers, boomer or sparker sources are initiated. • The following clearance zones will be implemented during operations of boomer or sparker sources: o 500 meters (656 feet) for all listed species o 100 meters (328 feet) for other marine mammals • The clearance zones must be visible to the naked eye or using appropriate visual technology during the entire clearance period before commencing operations of boomers and sparkers. • If any marine mammal is observed within the clearance zones during the 30-minute clearance period, ramp-up will not begin until the animal(s) is/are observed exiting the clearance zones, or until an additional time period has elapsed with no further sightings (i.e., 15 minutes for small odontocetes and • 30 minutes for all other species). Shutdown Zone • Shutdown zones will be monitored around the center of the sources for marine mammals. • The following shutdown zones will be implemented during all HRG survey activities: o 500 meters (656 feet) for NARWs; o 100 meters (328 feet) for all other marine mammal species; and o No shutdown zones for certain delphinids.	Marine Mammals (3.7)
53.	Ramp-up/Soft-Start Procedures: Pile Driving	A ramp-up (i.e., soft-start) will be used at the commencement of pile driving activity to provide additional protection to marine mammals potentially located near the construction effort. The following, additional soft-start procedures will be performed at the start of impact pile driving: • Soft-start will not begin until the clearance zone has been cleared by the visual PSOs or PAM operators, when appropriate. • Each soft-start will last for a minimum of 20 minutes. • A soft-start will also be implemented if piling is halted for 30 minutes or longer during installation.	Marine Mammals (3.7)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
		• If any marine mammal is detected within the applicable shutdown zone during the soft-start, activities will be delayed until the animal is observed leaving the shutdown zone or until 30 minutes have passed without a detection of the animal within the shutdown zone.	
54.	Ramp-up/Soft-Start Procedures: HRG Surveys	Ramp-up will not be initiated during periods of inclement conditions or if the clearance zone cannot be adequately monitored by PSOs using appropriate visual technology for a 30-minute period. • A ramp-up begins with the powering up of the smallest acoustic HRG equipment at its lowest power output. When technically feasible the power is then gradually turned up and other acoustic sources added such that the source level increases gradually. • PSOs will stand-watch for a minimum of 30 minutes to ensure the clearance zones are clear of marine mammals prior to commencement of ramp-up procedures. If a marine mammal is observed, ramp-up may not begin until the marine mammal has exited the clearance zone or until the following additional time periods have elapsed with no further sightings: o 30 minutes for NARW and other non-delphinid cetaceans; and o 15 minutes for delphinid cetaceans and pinnipeds.	Marine Mammals (3.7)
55.	Vessel Strike Avoidance Measures	The applicant will adhere to legally mandated vessel speeds, approach limits, and other vessel strike avoidance measures to reduce the risk of impact to NARWs as a result of the applicant activities in the SWDA. For example, federal regulations require that vessels maintain a separation distance of 457 meters (1,500 feet) from an observed NARW (see 50 CFR § 224.103 (c)). As safe and practicable, the applicant's vessels operating in the SWDA will also follow NOAA guidelines for vessel strike avoidance, including vessel speed restrictions and separation distances, that are applicable at the time of construction. During appropriate time periods and within certain areas (described in Section 4.1.5.3), the applicant-related vessels traveling to/from Salem Harbor will transit at 18.4 kilometers per hour (10 knots) or less within NOAA-designated NARW critical habitat and outside critical habitat. Regardless of the guidance in effect at the time of construction, vessel operators and crew will maintain a vigilant watch for marine mammals, and will slow down or maneuver their vessels, as appropriate, to avoid a potential interaction with a marine mammal. Vessels will also maintain required separation distances, which will be monitored by trained observers or PSOs. The applicant personnel will check the NMFS' NARW reporting systems on a daily basis. Additionally, it is expected that vessel captains will monitor USCG very high frequency Channel 16 throughout the day to receive notifications of any sightings. This information would be used to alert the team to the presence of a NARW in the area and to implement mitigation measures as appropriate. Whenever multiple Project vessels are operating, all sightings of listed species will be communicated between vessels to all PSOs.	Marine Mammals (3.7)
56.	Avoidance Measures during HRG Surveys	• All vessel operators and crews will maintain a vigilant watch for marine mammals at all times, and slow down or stop their vessel to avoid striking protected species, except under extraordinary circumstances when complying with this requirement would jeopardize the safety of the vessel or crew. • Monitoring of a 500 meters (1,640 feet) vessel strike avoidance zone may be performed by PSOs or crew members, however, any crew members responsible for monitoring will be trained to broadly identify protected species and marine mammals, such as the NARW or other whale species. • All vessel operators will reduce vessel speed to 10 knots (5.1 m/s) or less when mother/calf pairs, pods, or larger assemblages of marine mammals are observed near an underway vessel. • All vessel operators will comply with 10 knots (5.1 m/s) speed restrictions in any dynamic management area. • The applicant will monitor NMFS NARW reporting systems from November 1 through July 31 and whenever a dynamic management area is established within any areas vessels operate. • When marine mammals are sighted while a vessel is underway, the vessel shall take action to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area, reduce speed and shift the engine to neutral). This does not apply to any vessel towing gear or any vessel that is navigationally constrained. NARWs and ESA-listed marine mammals: • The applicant will ensure all vessels maintain a separation distance of 500 meters (1,640 feet) or greater from any sighted NARW and other ESA-listed marine mammals. • The applicant will ensure that the following avoidance measures are taken if a vessel comes within 500 meters (1,640 feet) of any NARW. o If underway, any vessel will steer a course away from any NARW at 10 knots (5.1 m/s) or less until the 500 meters (1,640 feet) minimum separation distance has been established, unless: – If a NARW is sighted within 100 meters (328 feet) to an underway vessel, the vessel operator must immediately reduce speed and promptly shift the engine to neutral. The vessel operator must not engage the engines until the NARW has moved beyond 100 meters (328 feet), at which point the vessel will steer a course away from any NARW at 10 knots (5.1 m/s) or less until the 500 meters (1,640 feet) minimum separation distance has been established. – If a vessel is stationary, the vessel will not engage engines until the NARW has moved beyond 100 meters (328 feet), at which point the vessel will steer a course away from any NARW at 10 knots (5.1 m/s) or less until the 500 meters (1,640 feet) minimum separation distance has been established. Non-ESA-listed whales: • The applicant will ensure that all vessels maintain a separation distance of 100 meters (328 feet) or greater from any sighted non-ESA-listed whales. • The following avoidance measures are taken if a vessel comes within 100 meters (328 feet) of any non-delphinid cetacean: o If underway, the vessel must reduce speed and shift the engine to neutral and must not engage the engines until the whale has moved beyond 100 meters (328 feet). o If stationary, the vessel must not engage engines until the whale has moved beyond 100 meters (328 feet). Delphinid cetaceans and pinnipeds: • The applicant will ensure that: o All vessel underway will not divert to approach any cetaceans or seals. o When feasible, all vessels will maintain a separation distance of 50 meters (164 feet) or greater from any sighted delphinid cetacean or pinniped. o All vessels underway will remain parallel to a sighted delphinid cetacean's or pinniped's course whenever possible and avoid excessive speed or sudden changes in direction. If a delphinid(s) is visually detected approaching the vessel or towed survey equipment (e.g., to bow ride), the PSOs and crew will use professional judgement in making course and/or speed adjustments o All vessels underway reduce vessel speed to 10 knots or less when pods (including mother/calf pairs) or large assemblages of delphinid cetaceans are observed. o If a whale is observed that cannot be confirmed to species, the vessel operator must assume that it is an ESA-listed species and take appropriate action.	Marine Mammals (3.7)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
		○ The requirements listed in this section do not apply if compliance would create imminent and serious threat to a person or vessel.	
57.	Potential UXO Detonations Protocols	UXO detonation may be required during construction and installation of the Project if other, preferable removal options (see Section 1.2.4) are not feasible. The exact number and type of UXOs that may be encountered in the project area are not yet known, but for the purpose of this LOA request it is assumed that up to 10 E12-bin UXOs may need to be detonated in place. The following mitigation measures will be implemented in the event that an UXO detonation is necessary. • Only one detonation may occur in a 24-hour period. • Detonations will only occur during daylight hours. • A 60-minute pre-start clearance period will be implemented prior to any in-situ UXO detonation. The clearance zone (see Table 69) must be fully visible for at least 30 minutes prior to commencing detonation. • All marine mammals must be confirmed to be out of the clearance zone prior to initiating detonation. • If a marine mammal is observed entering or within the relevant clearance zones prior to the initiation of detonation, the detonation must be delayed. • The detonation may commence when either the marine mammal(s) has voluntarily left the respective clearance zone and been visually confirmed beyond that clearance zone, or when 30 minutes have elapsed without redetection for whales, including the NARW, or 15 minutes have elapsed without redetection of dolphins, porpoises, and seals.	Marine Mammals (3.7)
58.	HRG Mitigation Protocols	HRG surveys may be required during construction and installation of the Project. Survey operations may be conducted over 24-hour periods. To provide survey flexibility, the specific locations and amount of survey vessels will be determined at the time of contractor selection. Mitigation measures implemented during HRG surveys for sources operating at or below 180 kilohertz can decrease the potential impacts to marine mammals from sound exposure by reducing the distance to disturbance and therefore the likelihood of Level B sound exposures. The applicant will comply with all applicable monitoring and mitigation regulations and any lease or permit conditions placed on the Project by regulatory agencies. The applicant is proposing the mitigation measures, provided in Table 70, to reduce the potential for negative impacts to marine mammals during survey acquisition; however, the final mitigation plan will be determined in consultation with NMFS. The selection of appropriate mitigation techniques will consider safety, effectiveness for the Project, and practical application of individual measures, as well as all measures in-concert. Shutdown Procedures • An immediate shutdown of HRG survey equipment specified in the Incidental Harassment Authorization permit will be required if a marine mammal is detected at or within its respective shutdown zone. • The vessel operator must comply immediately with any call for shutdown by the PSO. • Any disagreement between the PSO and vessel operator should be discussed only after shutdown has occurred. • HRG survey equipment may be allowed to continue operating if dolphins voluntarily approach the vessel (e.g., to bow ride) when the sound sources are at full operating power. • If a species approaches or enters the Level B harassment zone, shutdowns will occur if a marine mammal authorization has not been granted, or, an authorized species' takes have already been met. • If HRG survey equipment is shutdown longer than 30 minutes while PSOs have been monitoring, clearance followed by ramp-up activities will commence. • If another marine mammal enters a shutdown zone during the shutdown period, the HRG equipment may not restart until that animal is confirmed outside the respective exclusion or until the appropriate time has passed from the last sighting of the marine mammal. • After shutdown, ramp-up can be initiated once the shutdown zone are visually clear for the respective clearance timing. • Shutdown is not required for small delphinids from genera *Delphinus*, *Lagenorhynchus*, *Stenella*, and *Tursiops* that are detected voluntarily approaching the vessel or towed equipment. • If a PSO is unsure about the identification of a small delphinid, PSOs must use their professional judgement to decide as to whether shutdown should occur. Pauses in HRG Sources • If the acoustic source is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, it may be re-activated without ramp-up only if PSOs have maintained constant observation and no detections of any marine mammal have occurred within the respective shutdown zone. • Any shutdown exceeding 30 minutes must be followed by full ramp-up procedures.	Marine Mammals (3.7)
59.	PSO and Trained Observer	As noted above, the applicant will use NMFS-approved PSOs to monitor clearance and shutdown zones during pile driving and HRG survey activity as well as any UXO detonation. PSOs will use visual aids (e.g., range finders, binoculars, night vision devices, infrared/thermal camera) when necessary. PSOs will have no tasks other than to conduct observations, collect and report data, and communicate with and instruct relevant vessel crew regarding the presence of marine mammals and mitigation requirements.	Marine Mammals (3.7)
60.	Equipment and Technology	The applicant will consider the best commercially available equipment and technology for minimizing and avoiding impacts to marine mammals during construction and installation. This includes a variety of marine mammal detection and sound mitigation methodologies. Examples of potential technologies include PAM recorders, thermal cameras, and NAS. The applicant may collaborate with BOEM and NMFS to integrate practicable technology choices in mitigation equipment to meet the necessary standards for permitting and successful consultations. The applicant expects to use a PAM system to support visual monitoring of mitigation zones. The exact specifications of the PAM system, the software to be used, and the monitoring protocol will be identified prior to construction and in consultation with BOEM and NOAA Fisheries.	Marine Mammals (3.7)
61.	Environmental Training	All The applicant personnel working offshore will receive standardized environmental awareness training, which will stress individual responsibility for marine mammal and marine debris awareness and reporting. Prior to commencing offshore activities associated with either construction or HRG surveys, team members participate in induction meetings where summary materials are presented in person and with video materials covering topics including the following: • Code of Business Conduct including environmental commitments, • Relevant regulatory statutes, laws, and permit requirements, • Specific conditions and procedures related to offshore activities, e.g., marine debris protocols, marine mammal monitoring and mitigation, spill reporting, etc., • Protected species and trained crew observers procedures for sighting, reporting and protection of species including vessel strike avoidance and sound source management,	Marine Mammals (3.7)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
		• Protected species identification, and • Communication protocols. All personnel are required to register their participation in the induction training. These records are auditable. Additional refresher training related to the protected species monitoring and mitigation plan is provided offshore, and individuals joining the project who did not attend the initial induction training will be required to participate in a separate training session, with their participation recorded for the project. Environmental Management Plans will be created for construction operations and HRG surveys. The Environmental Management Plan includes all of the induction training components, including full copies of relevant permits and permit-required plans, protected species identification materials, communication flow charts and contact information, etc. These materials are all retained in accessible areas on all project vessels.	

[a] More information can be referenced from the applicants MMPA LOA application (JASCO 2022).

applicant = Park City Wind LLC; BOEM = Bureau of Ocean Energy Management; CFR = Code of Federal Regulations; COP = Construction and Operations Plan; dB = decibel; EIS = environmental impact statement; ESA = Endangered Species Act; ESP = electrical service platform; HDD = horizontal directional drilling; HRG = high-resolution geophysical; LOA = Letter of Authorization; m/s = meters per second; MMPA = Marine Mammal Protection Act; NARW = North Atlantic right whale; NAS = noise attenuation system; NHESP = Natural Heritage and Endangered Species Program; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; OECC = offshore export cable corridor; PAM = passive acoustic monitoring; PPPP = Piping Plover Project Plan; Project = New England Wind Project; PSO = protected species observer; SWDA = Southern Wind Development Area; TMP = traffic management plan; USCG = U.S. Coast Guard; UXO = unexploded ordnance; Vineyard Wind 1 = Vineyard Wind 1 Project; WTG = wind turbine generator.

Table H-2: Other Potential Mitigation Measures and Monitoring Efforts Analyzed

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
1.	Construction	Tree-clearing limitations	The applicant will not clear trees (greater than 3-inch-diameter at breast height) from April 1 to October 31. Should presence/probable absence surveys be conducted pursuant to current USFWS protocols and no northern long-eared bats (*Myotis septentrionalis*) are documented, this measure may not be necessary for ESA compliance relative to the species.	Bats (G.2.3)	BOEM BSEE
2.	Operations	Acoustic bat detectors	The applicant will deploy acoustic bat detectors on the nacelle and foundation of six WTGs for a duration of up to 3 years post-construction to refine the understanding of bat use of the Outer Continental Shelf and SWDA. Deployment configuration and number of detectors will be determined in consultation with BOEM and USFWS and will be finalized in the proposed Project's post-construction avian and bat monitoring plan.	Bats (G.2.3)	BOEM BSEE
3.	Construction, Operations, Decommissioning	Optical surveys of benthic invertebrates and habitat	The applicant will conduct optical drop camera surveys per the proposed Project's final fisheries monitoring plan. Stations will be placed on a 0.9-mile (1.5-kilometer) grid, with four quadrats sampled at each state twice per year between April and September. The drop camera surveys emulate the drop camera survey conducted in Lease Areas OCS-A 0501 and 0534 in 2012, 2013, and 2019 through 2022 (Bethoney et al. 2020) to support a before-after control impact study design. The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders. The applicant will consult with NMFS and BOEM prior to conducting surveys and address any agency comments in the survey plan.	Benthic Resources (3.4)	NMFS
4.	Operations	Monitoring and minimizing foundation scour protection	The applicant will conduct post-construction monitoring to document habitat disturbance and recovery at offshore wind turbine foundations per the benthic habitat monitoring plan. The applicant will consult with NMFS and BOEM prior to conducting inspections and address agency comments prior to implementation. As appropriate, based on proposed Project design and engineering, the applicant will apply foundation scour protection to only the minimum area needed for sufficient protection. Additionally, the applicant will inspect scour protection performance as part of its operations and maintenance plan. Underwater inspections of foundations and scour protection will be performed by remotely operated vehicles or other techniques. Underwater inspections will be conducted for 20% of foundations each year during the first 5 years of operations (i.e., all foundations are expected to be inspected once during the first 5 years). After the first 5 years of operations, the frequency of surveys may be adjusted over time based on results.	Benthic Resources (3.4)	NMFS
5.	Construction, Operations, Decommissioning	Plankton surveys	The applicant will conduct plankton surveys per the proposed Project's final fisheries monitoring plan to estimate the relative abundance and distribution of planktonic species such as larval lobster using a towed neuston net to allow for comparison of baseline and post-construction results. Plankton tows will be conducted at 30 survey locations concurrently with the ventless trap surveys (i.e., two times per month from May through December). The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders.	Benthic Resources (3.4)	NMFS
6.	Operations	Post-construction bird monitoring	The applicant will finalize a post-construction bird monitoring plan prior to the start of operations, including the following components: • Within the first year of operations, the applicant will install automated radio telemetry receiving stations (Motus) and acoustic monitoring devices to estimate the exposure of threatened and endangered species and other migratory birds to the operating wind facility. • The applicant will perform acoustic monitoring of nocturnal songbirds at ESPs for up to 3 years post-construction. • The applicant will contribute $125,000 per year for 20 years for a tagging program for ESA and non-ESA listed species to either a regional monitoring fund (e.g., the Regional Wildlife Science Collaborative) or directly to a 3rd party (e.g., academic institution or consultancy), with species and type of tags to be selected based on research priorities at the time. • The applicant will install ~12 Motus receiver stations on turbines and deploy two Motus receiver stations onshore, to be re-evaluated every 5 years offshore and 3 years onshore. • The applicant will provide quarterly monitoring progress reports during the first year of post-construction avian and bat monitoring and comprehensive annual reports, followed by a discussion of each year's results with BOEM, BSEE, and USFWS, including the potential need for reasonable revisions to the monitoring plan. All data generated as part of pre- and post-construction monitoring will be made available to the public through BOEM's website or 3rd party websites. The applicant will propose data sharing methods in annual monitoring reports and discuss with BOEM, BSEE, and USFWS during annual monitoring meetings.	Birds (G.2.4)	BOEM BSEE
7.	Construction, Operations, Decommissioning	Bird and bat mortality reporting	The applicant must submit an annual report covering each calendar year, due by January 31 of the following year, documenting any dead (or injured) birds or bats found on vessels and structures or in the ocean during construction, operations, and decommissioning. The report must be submitted to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov) and USFWS (at newengland@fws.gov). The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with federal or research bands must be reported to the U.S. Geological Survey Bird Band Laboratory (https://www.usgs.gov/labs/bird-banding-laboratory). Any occurrence of dead ESA birds or bats must be reported to BOEM, BSEE, and USFWS as soon as practicable (taking into account crew and vessel safety), but no later than 5 to 10 business days after the sighting. If practicable, carefully collect the dead specimen and preserve the material in the best possible state.	Birds (G.2.4)	BOEM BSEE
8.	Operations	Bird deterrent devices	The applicant will install bird deterrent devices on WTGs and ESPs to minimize bird attraction. The location of bird-deterrent devices must be proposed by the applicant based on best management practices applicable to the appropriate operation and safe installation of the devices. The applicant must confirm the locations of bird-deterrent devices as part of the as-built documentation it must submit with the facility design report for the proposed Project. Observed use of WTGs and ESPs by birds will be documented in quarterly and annual reports and the need for supplemental deterrents discussed as part of annual meetings with BOEM, BSEE, and USFWS.	Birds (G.2.4)	USFWS BSEE
9.	Construction, Operations, Decommissioning	Offshore lighting restrictions	The applicant will use minimal lighting intensity necessary on vessels, WTGs, and ESPs to permit safe construction, operations, and decommissioning activities while reducing potential attraction of birds and sea turtles to proposed Project vessels and components. Conditional on USCG approval, to minimize the potential of attracting migratory birds, the top of each light will be shielded to prevent upward illumination.	Birds (G.2.4); Sea Turtles (3.8)	USFWS USCG

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
10.	Construction	Dredging and cable installation methods and timing	The applicant will conduct dredging and cable installation activities using the least environmentally harmful method effective in each area to avoid/minimize impacts on benthic habitat to the maximum extent practicable. The applicant will avoid perpendicular crossings of sand wave features where feasible and safe. The applicant will require all vessels deploying anchors to use, whenever feasible and safe, mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor. The applicant will require nearshore cable-laying activities to avoid high concentrations of fishing activities and natural resource events (spawning and egg laying), and comply with conditions imposed by MassDEP for activities in state waters.	Coastal Habitats and Fauna (3.5)	MassDEP 401 Water Quality Certification NMFS EFH
11.	Construction, Operations, Decommissioning	Anchoring plan	The applicant will implement an anchoring plan for all areas where anchoring is being used to avoid and minimize construction impacts on sensitive habitats to the maximum extent practicable, including hard-bottom and structurally complex habitats. The anchoring plan must include the planned location of anchoring activities, sensitive habitats and locations, seabed features, potential hazards, and any related facility installation activities such as cables, WTGs, and ESPs, as appropriate. The applicant will require all vessels deploying anchors to use, whenever feasible and safe, mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor. The anchoring plan must be provided for BOEM and NOAA review and comment before construction begins.	Coastal Habitats and Fauna (3.5)	BOEM BSEE
12.	Construction	Benthic monitoring plan	The applicant will be required to consult with NMFS and the MassDEP and the Massachusetts Division of Marine Fisheries and address agency comments before finalizing and implementing the monitoring plan. If recovery is not observed within 5 years, the applicant, BOEM, and NMFS will confer regarding potential additional monitoring. The monitoring plan must evaluate if the cable protection (including different types of cable projection) used is mitigating impacts on juvenile cod HAPC. The applicant will provide reporting per the proposed Project's final benthic monitoring plan.	Coastal Habitats and Fauna (3.5)	MassDEP 401 Water Quality Certification BOEM BSEE Nantucket Conservation Commission
13.	Construction	Benthic impact monitoring	To monitor potential benthic impacts, post-construction acoustic surveys (e.g., multibeam backscatter and side scan sonar) capable of detecting bathymetry changes of 0.5 meter (1.6 feet) or less should be completed to demonstrate how the bottom was modified by preparation and construction activities. In addition, locations of relocated boulders, created berms, and scour protection, including cable protection measures (i.e., concrete mattresses) should be provided to regulatory agencies. This information will not only inform impacts on benthic habitat but also help inform all interested parties of potential gear obstructions.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5)	BOEM BSEE NMFS USACE
14.	Construction	Scour protection and cable protection plans	The lessee will be required to develop and implement scour protection and cable protection plans to facilitate the avoidance and minimization of impacts on sensitive benthic habitats.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5)	BOEM BSEE NMFS USACE
15.	Construction	Potential gear obstructions	Locations of relocated boulders, created berms, and scour protection, including cable protection measures (i.e., concrete mattresses), should be provided to NOAA Fisheries, all other federal agencies with maritime jurisdiction, and the public as soon as possible to help inform all interested parties of potential gear obstructions.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5)	BOEM BSEE NMFS USACE
16.	Construction, Operation	Anti-corrosion protections	Any anti-corrosion protection methods or systems proposed should be identified. If sacrificial anodes are used, Al anodes should be selected over Zn anodes for external surfaces.	Water Quality (G.2.2); Benthic Resources (3.4)	BOEM BSEE NMFS
17.	Construction	Final cable protection in hard bottom	Where cable protection is required, the applicant will make every reasonable effort to use rock placement or a gabion system, as appropriate, to mimic native surficial material and reduce the use of concrete mats for permanent cable protection. Where concrete mattresses are used, the applicant will use environmentally friendly mattresses. Cable protection measures will consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-dimensional complexity, both in height and in interstitial spaces. The applicant will consider nature-inclusive designs for optimized cable protection (Hermans et al. 2020). The applicant will consult with NMFS and BOEM prior to the implementation of hard-bottom cable protection measures. BOEM will make recommendations regarding the final selection of engineered stone in consultation with NMFS.	Coastal Habitats and Fauna (3.5)	Massachusetts CZM BOEM BSEE
18.	Construction	Evaluation of additional benthic habitat data prior to cable laying	At a minimum, the applicant will process 75 benthic grabs over the entire length of the OECC (with approximately 42 in the eastern Muskeget section) and 60 underwater video transects over the entire length of the OECC (with 28 transects in the eastern Muskeget section). This information will be used to update habitat maps to resolve and delineate seafloor habitats consistent with NOAA's May 2020 Recommendations for Mapping Fish Habitat (NOAA 2020). Based on this review, the applicant will use the additional data to avoid eelgrass and hard-bottom/structurally complex habitats (including juvenile cod HAPC) to the maximum extent practicable while also maintaining a feasible route.	Coastal Habitats and Fauna (3.5)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
19.	Construction	Dredge disposal sites	Where a TSHD is used, it is anticipated that the trailing suction hopper dredge will dredge along the cable alignment until the hopper is filled to an appropriate capacity, then it will navigate several hundred meters away and deposit the dredged material within an area of the surveyed corridor that also contains sand waves. Sand wave areas are identified in the COP (Figure 3.3-3 and Figure 4.3-3; Epsilon 2023). In addition, the applicant will report the locations of dredge disposal sites within state waters (high tide line to 3 nautical miles (3.5 miles) from shore) to BOEM, USACE, NOAA, MassDEP, and Massachusetts CZM within 30 days of disposal of materials. These locations must be reported in latitude and longitude degrees to the nearest 10 thousandth of a decimal degree (roughly the nearest meter) or as precise as practicable. If use of a TSHD is required during export cable installation, the applicant may be required to obtain a Marine Protection, Research, and Sanctuaries Act Section 103 permit from USACE to identify specific dumping locations for dredge material and the potential impacts of disposing dredge material in those locations. Under Section 103 of Marine Protection, Research, and Sanctuaries Act, USACE regulates the transportation of dredged material for purposes of dumping it into ocean water. At this time, the potential for use of a TSHD is low, and the applicant is not currently pursuing a Section 103 permit. Should the applicant determine the definitive need for the use of a TSHD during export cable installation, the applicant will coordinate with USACE regarding Section 103 permitting and supplemental National Environmental Policy Act review, as applicable, prior to conducting dredging activities as part of export cable installation. Considering the area affected in relation to the expanse of surrounding sand wave habitat, impacts would likely be minor.	Coastal Habitats and Fauna (3.5)	USACE MassDEP Massachusetts CZM
20.	Construction, Operations, Decommissioning	PAM	The applicant will develop mitigation and monitoring measures similar to those in the Vineyard Wind 1 COP (Appendix III-M Table 31). The applicant will use PAM buoys or autonomous PAM devices to record ambient noise and marine mammal species vocalizations in the lease area (before, during, and after construction [at least 2 years of operations]) to monitor impacts including vessel noise, pile driving, WTG operation, and large whale detections in the SWDA. Results must be provided within 90 days of buoy collection and again within 90 days of the 1-year and 2-year anniversary of collection. The underwater acoustic monitoring must follow standardized measurement and processing methods and visualization metrics developed by the Atlantic Deepwater Ecosystem Observatory Network for the U.S. Mid- and South Atlantic Outer Continental Shelf (UNH Undated). At least two buoys must be independently deployed within the lease area, or one or more buoys must be deployed in coordination with other acoustic monitoring efforts in the Rhode Island and Massachusetts Lease Areas.	Marine Mammals (3.7)	BOEM BSEE NMFS
21.	Construction, Operations, Decommissioning	Long-term PAM	Highly migratory species like baleen whales occupy different parts of the Atlantic OCS at different times of the year. PAM is an effective tool to monitor baleen whale habitat use because it can detect the presence of whales when other methods are not feasible, such as periods of low visibility, poor weather, or when animals are far below the ocean's surface. The applicant must conduct long-term PAM to record ambient noise and marine species vocalizations in the lease area. Analysis of PAM data collected within the lease area allows for comparisons with acoustic data gathered during pre-construction periods, both in terms of the soniferous species that are present, as well as any changes to ambient noise due to the operation of the wind farm, which could affect species' distributions and/or behaviors. In addition, data collected within a lease area can be compared to data collected throughout the broader region, thus supporting cumulative effects analysis for highly migratory species.	Marine Mammals (3.7)	BOEM BSEE NMFS
22.	Construction	Pile-driving monitoring plan and PSO requirements	The applicant will submit a pile-driving monitoring plan to BOEM and NMFS for review and approval a minimum of 180 days prior to the commencement of pile-driving activities. The plan must: • Contain information on the visual and PAM components of the monitoring plan; • Confirm that the full extent of the harassment distances from piles (as defined in other mitigation and monitoring measures) are monitored for marine mammals to ensure that all potential take is documented; • Include number of PSOs and/or Native American monitors that will be used, the platforms and/or vessels upon which they will be deployed, and contact information for the PSO provider(s); and • Include measures for enhanced monitoring capabilities in the event that poor visibility conditions unexpectedly arise, and pile driving cannot be stopped. The plan may also include deploying additional observers, using night vision goggles, or using PAM with the goal of ensuring the ability to maintain all exclusion zones in the event of unexpected poor visibility conditions. A communication plan detailing the chain of command, mode of communication, and decision authority must be described. PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to adequately monitor the area of the exclusion zone. Additionally, all PSO and Native American monitors must complete a commercial PSO training program. The size of the exclusion zone may vary with specific time-of-year requirements for NARWs (*Eubalaena glacialis*) and should be described in the plan.	Marine Mammals (3.7)	NMFS National Historic Preservation Act BSEE
23.	Construction	Protocol when marine mammals are sighted during pre-pile-driving exclusion zones	If a marine mammal is observed entering or within the relevant exclusion zones prior to the initiation of pile-driving activity, pile-driving activity must be delayed (unless activities must proceed due to human safety considerations) until: • The animal is verified to have voluntarily left and heading away from the exclusion area; or • 30 minutes have elapsed without re-detection (for mysticetes, sperm whales [*Physeter macrocephalus*], Risso's dolphins [*Grampus griseus*], and pilot whales); or • 15 minutes have elapsed without re-detection of other marine mammals.	Marine Mammals (3.7)	BOEM NOAA BSEE
24.	Construction	Enhanced time-of-year pile-driving shutdown and restart procedures for NARWs (May 1 to May 14 and November 1 to December 31)	If a NARW is observed or otherwise detected within the exclusion zone, pile-driving activities must stop (unless activities must proceed for human safety or installation feasibility concerns) and may not resume until: • The following day, or until a follow-up aerial or vessel-based survey is able to confirm all NARW(s) have departed the 6.2-mile extended exclusion zone, as determined by the lead PSO after 1 full day of monitoring to confirm NARW(s) have left the 6.21-mile exclusion zone (May 1 to 14); • Confirmation that all NARW(s) have left the 6.21-mile exclusion zone (November 1 to December 31); or • Confirmation that all of NARW(s) have left the 0.62-mile exclusion zone after 60 minutes of monitoring (May 15 to October 31).	Marine Mammals (3.7)	BOEM NOAA BSEE

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25.	Construction	Exclusion zones (no-go zones) for marine mammals	The applicant will reduce impact on marine mammals through the use of continuous PAM, visual monitoring by PSOs, or Native American monitors during pile-driving activities following standard protocols and data collection requirements specified by BOEM. PSOs will establish the following exclusion zones for NARWs 60 minutes prior to pile-driving activities through 30 minutes post-completion of pile-driving activity: • At all times of year that pile driving takes place, for purposes of monitoring the exclusion zone, any large whale sighted by a PSO within 3,281 feet (1,000 meters [a NARW exclusion zone]) that cannot be identified to species must be treated as if it were a NARW. Additionally, a NARW observation at any distance from the pile must be treated as an observation within the exclusion zone and trigger any required delays or shutdowns in pile installation. • From November 1 to December 31 and May 1 to May 14, the applicant must establish a 6.2-mile (10-kilometer) exclusion zone for NARWs (the applicant has the option to use aerial or vessel-based surveys from May 1 to May 14). • For any piles driven May 15 to May 31, the exclusion zone must be extended from 3,281 feet (1,000 meters) to 6,562 feet (2,000 meters) for monopiles and 5,249 feet (1,600 meters) for jacket (i.e., half distance to Level B threshold) to minimize the extent of any take of NARWs. • For any pile driving June 1 to October 31, the applicant must establish a 5,249-foot (1,000-meter) clearance zone for NARW with the exception as follows. Where the predicted Level B harassment zone will overlap with a DMA or Right Whale Slow Zone, the exclusion zone must be extended from 3,281 feet to 6,562 feet (1,000 to 2,000 meters) for monopiles and 5,249 feet (1,600 meters) for jacket piles (i.e., half distance to Level B threshold) to minimize the extent of any take of NARWs. For all pile-driving activity, the applicant must designate clearance zones with radial distances as follows: • All other mysticete whales (including humpback [*Megaptera novaeangliae*], fin [*Balaenoptera physalus*], sei [*Balaenoptera borealis*], minke [*Balaenoptera acutorostrata*] whale, and sperm [*Physeter macrocephalus*] whale): 1,649-foot (500-meter) exclusion zone at all times; • Harbor porpoise [*Phocoena phocoena*]: 394-foot (120-meter) exclusion zone at all times; and • All other marine mammals not listed above (including dolphin and pinnipeds): 164-foot (50-meter) exclusion zone at all times. Monitoring for marine mammals must occur over the entire Level B distance for all marine mammals to document impacts and any potential take.	Marine Mammals (3.7)	BOEM NMFS NOAA BSEE
26.	Construction	NARW PAM monitoring	The applicant will prepare and submit a PAM plan describing all equipment, procedures, and protocols to BOEM and NMFS at least 180 days prior to initiation of pile-driving activities. The PAM system must be designed such that detection capability extends to 6.21 miles (10 kilometers) from the pile-driving location. If the PAM operator has at least 75% confidence that a vocalization originated from a NARW within 6.21 miles (12 kilometers) of the pile-driving location, the PAM operator must determine that a NARW has been detected. The applicant must continue to deploy the PAM system that is in place for May 1 to May 14 through May 31 and implement an extended PAM monitoring zone of 6.21 miles (10 kilometers) around any pile to be driven with all detections of NARWs provided to the visual PSO to increase situational awareness and to be considered as pile driving is planned. At all times of year that pile driving takes place, any PAM detection of a NARW within the clearance/exclusion zone surrounding a pile must be treated the same as a visual observation and trigger any required delays in pile installation. Between June 1 and October 31, if a DMA or Right Whale Slow Zone is designated that overlaps with a predicted Level B harassment zone (monopile foundation: 16,404 feet [5 kilometers] with impact only and 91,864 feet [28 kilometers] for impact with vibratory; jacket foundation: 16,404 feet [5 kilometers] with impact only and 95,144 feet [29 kilometers] for impact and vibratory]) from a pile to be installed, the PAM system in place during this period must be extended to the largest practicable detection zone to increase situational awareness of the visual PSOs and for purposes of planning pile installation. At all times of year, any visual or PAM detection in the seasonal exclusion zones must be treated the same as a visual observation and trigger any required delays or shutdowns in pile installation.	Marine Mammals (3.7)	BOEM NMFS NOAA BSEE
27.	Construction	Protocols for shutdown and power-down when marine mammals are sighted during pile driving	If a marine mammal is observed entering or within the relevant exclusion during pile driving, the hammer must be shut down (unless activities must proceed for human safety or installation feasibility) until: • The animal is verified to have voluntarily left and heading away from the exclusion area; or • 30 minutes have elapsed without re-detection (for mysticetes, sperm whales, Risso's dolphins, and pilot whales); or • 15 minutes have elapsed without re-detection of other marine mammals; or • Enhanced time-of-year NARW protocols are followed. If shutdown is called for but the applicant determines shutdown is not technically feasible due to human safety concerns or to maintain installation feasibility, reduced hammer energy must be implemented, when the lead engineer determines it is technically feasible.	Marine Mammals (3.7)	BOEM NMFS NOAA BSEE

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28.	Construction, Operations, Decommissioning	PSO training requirements	The applicant will provide PSOs through a third-party provider. PSOs must have no tasks other than to conduct observational effort, collect and report data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards). PSOs, Native American monitors, and PAM operators must have completed a commercial PSO training program for the Atlantic Ocean with an overall examination score of 80% or greater (Baker et. al 2013). Training certificates for individual PSOs must be provided to BOEM upon request. PSOs, Native American monitors, and PAM operators must be approved by NMFS prior to the start of a survey. Application requirements to become a NMFS-approved PSO for construction activities can be found at https://www.fisheries.noaa.gov/new-england-mid-atlantic/careers-and-opportunities/protected-species-observers or for geological and geophysical surveys by sending an inquiry to nmfs.psoreview@noaa.gov. The applicant must provide documentation of NMFS approval for individual PSOs to BOEM upon request. For the following activities, lead PSOs must be deployed as part of the minimum number of PSOs as follows: at least one lead PSO must be on duty at any given time as the lead PSO or PSO monitoring coordinator during pile driving; at least one lead PSO must be present on each HRG survey vessel; PSOs on transit vessels must be trained but do not need to be authorized as a lead PSO. Any required lead PSOs must have prior approval from NMFS to be a lead or unconditionally approved PSO. PSOs on duty must be clearly listed on daily data logs for each shift. A sufficient number of PSOs, which will be consistent with the NMFS BO and as prescribed in the final LOA, must be deployed to record data in real time and effectively monitor the affected area for the proposed Project, including visual surveys in all directions around a pile, PAM, and continuous monitoring of sighted NARWs in the area to meet the number of PSOs required for enhanced seasonal monitoring requirements. 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. Visual monitoring must occur from the most appropriate vantage point on the associated operational platforms that allows for 360-degree visual coverage around a vessel. The applicant must ensure that suitable equipment is available to PSOs, including binoculars, range-finding equipment, a digital camera, and electronic data recording devices (e.g., a tablet), to adequately monitor the distance of the watch and exclusion zones, determine the distance to protected species during surveys, record sightings and verify species identification, and record data. Observations must be conducted while free from distractions and in a consistent, systematic, and diligent manner.	Marine Mammals (3.7)	BOEM NOAA BSEE
29.	Construction, Operations, Decommissioning	Vessel strike avoidance of marine mammals (non-geophysical survey vessels)	Vessel operators and crews must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any marine mammal as long as it is safe to do so. Vessel speeds must be reduced to speeds less than 10 knots when mother/calf pairs, pods, or large assemblages of cetaceans are observed within the path of the vessel. All vessels must also abide by existing applicable vessel speed regulations. **Large whales:** Avoidance measures must occur for listed whales or any other unidentified whale sighted within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard) at a distance of 1,640 feet (500 meters) or less from a survey vessel. Trained crew or PSOs must notify the vessel captain of any whale within 1,640 feet (500 meters) of vessel within this area. The vessel captain must immediately implement strike-avoidance procedures to maintain a separation distance of 1,640 feet (500 meters) from all listed species of whales including changing vessel direction or reducing vessel speed to allow the animal to travel away from the vessel. Any time a listed whale is within 656 feet (200 meters) of an underway vessel, a full stop is required if safety permits. If a whale is observed but cannot be confirmed as a species other than a NARW, the vessel operator must assume that it is a NARW and take appropriate action to avoid the animal. **Small cetaceans and seals**: For small cetaceans and seals, all vessels must maintain a minimum separation distance of 164 feet (50 meters) to the maximum extent practicable with an exception made for those animals that approach the vessel. When marine mammals are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If marine mammals are sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral and not engage the engines until animals are clear of the area.	Marine Mammals (3.7)	BOEM NMFS BSEE
30.	Construction, Operations, Decommissioning	Geophysical survey clearance of exclusion zone and restart protocols following shutdowns	At the beginning of each survey, active sparker and other sub-bottom profiling acoustic sound sources less than 180 kHz requiring exclusion zones (excludes the Innomar), must not be activated until a PSO has verified the 656-foot exclusion zone to be clear of all whales for a full 30 minutes and a 328-foot exclusion zone to be clear for other marine mammals for a full 15 minutes. Any time a marine mammal is sighted within the exclusion zone, the PSO will require the resident engineer or other authorized individual to cause a shutdown of the survey equipment. Geophysical survey equipment may be allowed to continue operating if marine mammals voluntarily approach the vessel (e.g., to bow ride) when the sound sources are at full operating power. The vessel operator must comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion must occur only after shutdown. Following a shutdown, ramp up of the equipment may begin immediately only if visual monitoring of the exclusion zone continues throughout the shutdown, the animals causing the shutdown were visually followed and confirmed by PSOs to be outside of the exclusion zone and heading away from the vessel, and the exclusion zone remains clear of all protected species All shutdowns of geophysical survey equipment due to protected species sightings that are not re-sighted require the following monitoring periods before ramp-up procedures: 15 minutes for small cetaceans and seals and 30 minutes for ESA-listed whales, humpback whales, Kogia, and beaked whales. Geophysical exclusion, survey power-up, and post-shutdown exclusion protocols must be followed for all ESA-listed species, in addition to any future ITA requirements under the Marine Mammal Protection Act for marine mammals. For non-ESA-listed marine mammals, requirements must be followed as required by NMFS through proposed Project-specific mitigation and monitoring requirements of ITAs. If an ITA is not obtained, the applicant must follow the measures above for non-listed species.	Marine Mammals (3.7)	BOEM BSEE
31.	Construction, Operations, Decommissioning	Vessel speed requirements November 1 through May 14	From November 1 through May 14, all vessels associated with the proposed Project must travel at speeds less than 10 knots when transiting to, from, or within the SWDA, except within Nantucket Sound (unless an active DMA is in place).	Marine Mammals (3.7)	BOEM NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
32.	Construction, Operations, Decommissioning	Vessel speed requirements in DMAs	All vessels, regardless of length, must travel at speeds less than 10 knots within any NMFS-designated DMA	Marine Mammals (3.7)	NOAA BSEE
33.	Construction, Operations, Decommissioning	Reporting of all NARW sightings	If a NARW is observed at any time by PSOs or personnel on any proposed Project vessels, during any Project-related activity, or during vessel transit, the applicant must immediately report the sighting information to NMFS and BOEM (the time, location, and number of animals) to the NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622), the USCG via channel 16, and through the WhaleAlert app (Whale Alert Undated).	Marine Mammals (3.7)	NMFS NOAA BSEE
34.	Construction	Adaptive refinement of exclusion zones and monitoring protocols	The applicant will reduce unanticipated impacts on marine trust resources through near-term refinement of exclusion zones by refining pile-driving monitoring protocols based on monthly or annual monitoring results, in coordination with BOEM and NMFS. The NMFS BO and LOA will identify minimum sizes of exclusion zones and any modifications will increase the zones and not decrease the zones.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS BSEE
35.	Construction	Pile-driving SFV plan	The applicant will conduct field verification during pile driving to ensure that noise attenuation requirements are met. A sound source verification plan will be submitted to USACE and BOEM at renewablereporting@boem.gov, and to NMFS at PR.ITP.MonitoringReports@noaa.gov and nmfs.gar.incidental-take@noaa.gov for review and approval 180 days prior to the commencement of field activities for pile driving. Sound field verification must be carried out for the first three monopile foundations and the first two jacket foundations to be installed, including vibratory and impact pile driving. Subsequent SFV is required should additional piles be driven that are anticipated to produce louder sound fields than those previously measured. To ensure that the entire action is within scope of the Project design envelope, further pile-driving installations must be monitored to effectively represent the entire construction stage, as every pile is capable of producing impact. At minimum, SFV must be performed at: • Two installations at representative depths (one shallower, one deeper) of each pile size and each foundation type installed; • One foundation installed each in November and December if any are installed in those months; • One foundation in each calendar year of installation; and • The installation of the largest hammer used in each of the above situations. The plan must be sufficient to document sound propagation from the pile and distances to isopleths for potential injury and harassment. The measurements must be compared to the Level A and Level B harassment zones for marine mammals (and the injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon).	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS BSEE
36.	Construction	Pile-driving weather and time restrictions	To minimize the impacts of sun glare on visibility, no pile driving may begin until at least 1 hour after (civil) sunrise to ensure effective visual monitoring can be accomplished in all directions. To minimize the impacts of sun glare on visibility and to minimize the potential for pile driving to continue after sunset when visibility will be impaired, no pile driving may begin within 1.5 hours of (civil) sunset unless an approved alternative monitoring plan is implemented. Pile driving must only commence when all exclusion zones are fully visible (i.e., are not obscured by darkness, rain, fog, etc.) for at least 30 minutes. If conditions (e.g., darkness, rain, fog, etc.) prevent the visual detection of marine mammals and sea turtles in the exclusion zones, construction activities must not be initiated until the full extent of all exclusion zones are fully visible. The lead PSO will determine as to when there is sufficient light to ensure effective visual monitoring can be accomplished in all directions and when the alternative monitoring plan will be implemented. The applicant must develop and implement measures for enhanced monitoring in the event that poor visibility conditions unexpectedly arise, and pile driving cannot be stopped due to safety or operational feasibility. The applicant must prepare and submit an alternative monitoring plan to NMFS and BOEM for NMFS' review and approval at least 180 days prior to the planned start of pile driving. This plan may include deploying additional observers, alternative monitoring technologies (i.e., night vision, thermal, infrared), and/or use of PAM with the goal of ensuring the ability to maintain all exclusion zones for all ESA-listed species in the event of unexpected poor visibility conditions. A Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan would also be prepared and submitted to outline how piledriving during periods of reduced visibility or during nighttime would occur.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS BSEE
37.	Construction, Operations	Marine debris awareness and elimination	Marine debris is defined by BSEE as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper, or any other human-made item or material that is lost or discarded in the marine environment. The applicant must ensure that vessel operators, employees, and contractors engaged in offshore activities pursuant to the COP are briefed on marine debris prevention. BOEM must ensure that the applicant employees and contractors receive training to understand and implement best practices to ensure that debris is not intentionally or accidentally discharged into coastal or marine environments. Training must occur for all employees and contract personnel on the proper storage and disposal practices at-sea to reduce the likelihood of accidental discharge of marine debris at all at-sea and dockside operations that can affect protected species through entanglement or incidental ingestion. Training must include the environmental and socioeconomic impacts associated with marine trash and debris, as well as their responsibilities for ensuring that trash and debris are not intentionally or accidentally discharged into coastal and marine environments. By January 31 of each year, the applicant must submit to the U.S. Department of the Interior an annual report that describes its marine trash and debris awareness training process, number of people trained, estimated related costs, and certifies that the training process has been followed for the previous calendar year. Reports must be submitted to BOEM (renewable_reporting@boem.gov) and to BSEE (marinedebris@bsee.gov). In the event that any materials unexpectedly enter the water, personnel must follow best practices to recover it if conditions are safe to do so, or notify the appropriate officials if conditions are unsafe. Briefing materials on marine debris awareness, prevention, and protected species are available at www.bsee.gov/debris. Incidents of lost debris must be reported to BSEE with a full description, including date, global positioning system coordinates, description of debris (dimensions, composition, float/sink, markings, description/characteristics), efforts to recover, and recovery success.	Marine Mammals (3.7); Sea Turtles (3.8)	BSEE BSEE

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38.	Construction	Pile-driving reports	During the pile driving/construction period, the applicant must compile and submit weekly reports that document start and stop of all pile driving daily, the start and stop of associated observation periods by the PSOs, details on the deployment of PSOs, and a record of all observations of marine mammals and sea turtles. These weekly reports must be submitted by the PSO providers to BOEM at renewable_reporting@boem.gov and NMFS at PR.ITP.MonitoringReports@noaa.gov and nmfs.gar.incidental-take@noaa.govand can consist of raw data. Weekly reports are due on Wednesday for the previous week (Sunday through Saturday). Required data and reports may be archived, analyzed, published, and disseminated by BOEM. PSO data must be reported weekly (Sunday through Saturday) from the start of visual and/or PAM effort during construction activities and every week thereafter until the final reporting period. Weekly reports are due on Wednesday for the previous week. Any editing, review, and quality assurance checks must only be completed by the PSO provider prior to submission. Monthly summary reports must be submitted by the applicant in coordination with PSO providers as needed. Qualified PSOs must monitor watch and exclusion zones when using geological and geophysical equipment that may affect protected species. **Reporting Instructions** The applicant must submit a monthly summary report of construction activities on the 15th of each month including summaries of pile driving, vessel operations (including port departures, number, type of vessel, and route), protected species sightings, vessel strike-avoidance measures taken, and any shutdowns or takes that may have potentially occurred, as follows: • The applicant must require PSO providers to submit PSO data in Excel format every 7 days. • Data must be collected in accordance with standard reporting forms, software tools, or electronic data forms approved by BOEM for the particular activity. • Forms must be filled out for each vessel with PSOs aboard. • Do not use NA for unfilled cells; leave them empty. • Submit report in Word and Excel formats (do not submit a pdf). • All dates must be entered as YYYY-MM-DD. • All times must be entered in 24 Hour UTC as HH:MM. • New entries should be made on the Effort form each time a pile segment or weather conditions change and at least once an hour as a minimum. • Both weekly and monthly reports must be submitted to BOEM at renewable_reporting@boem.gov. Always check forms for completeness and resolve any problems before submittal. Name the file: Lease#_ ProjectName_PSOData_YearMonthDay to YearMonthDay.xls The applicant will report the following Project, Operations, Detection, and Effort data fields in Excel format as weekly reports during construction. These data may be generated through software applications or otherwise recorded electronically by PSOs. Applications developed to record PSO data are encouraged as long as the data fields listed below can be recorded and exported to Excel. Alternatively, BOEM has developed an Excel spreadsheet with all the necessary data fields available upon request. **Project Information for Pile Driving** • Project name • Lease number • State coastal zones • PSO contractor(s) • Vessel name(s) • Reporting dates • Sound sources including hammer type(s) and power levels used • Visual monitoring equipment used (e.g., bionics, magnification, infrared cameras, etc.) • Distance-finding method used • PSO names and training • Observation height above sea surface **Operations Information for Pile Driving** • Date • Hammer type (make and model) • Greatest hammer power used for each pile • Pile identifier and pile number for the day (e.g., pile two of three for the day) • Pile diameters • Pile length • Pile locations (latitude and longitude) • Time pre-exclusion visual monitoring began in UTC (HH:MM) • Time pre-exclusion monitoring ended in UTC (HH:MM) • Time pre-exclusion PAM monitoring began in UTC (HH:MM) • Time PAM monitoring ended in UTC (HH:MM) • Duration of pre-exclusion and PAM visual monitoring • Time power up/ramp up began • Time equipment full power was reached	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Duration of power up/ramp up • Time pile driving began (hammer on) • Time pile-driving activity ended (hammer off) • Duration of activity • Shutdown/power-down occur (Y/N) • Time shutdown was called for (UTC) • Time equipment was shut down (UTC) • Record any habitat or prey observations • Record any marine debris sighted **Detection Information for Protected Species** • Date (YYYY-MM-DD) • Sighting ID (V01, V02, or sequential sighting number for that day) (multiple sightings of same animal or group should use the same ID) • Date and time at first detection in UTC (YY-MM-DDT HH:MM) • Time at last detection in UTC (YY-MM-DDT HH:MM) • PSO name(s) (Last, First) • Effort (ON=source on; OFF =source off) • Latitude (decimal degrees dd.ddddd), longitude (decimal degrees dd.ddddd) • Compass heading of vessel (degrees) • Water depth (meters) • Swell height (meters) • Douglas sea scale • Precipitation • Visibility (kilometers) • Cloud coverage (%) • Glare • Sightings including common name, scientific name, or family • Certainty of identification • Number of adults • Number of juveniles • Total number of animals • Bearing to animal(s) when first detected (ship heading + clock face) • Range from vessel (reticle distance in meters) • Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) • Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) • Direction of travel/first approach (relative to vessel) • Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes) • If any bow-riding behavior observed, record total duration during detection (HH:MM) • Initial heading of animal(s) (degrees) • Final heading of animal(s) (degrees) • Source activity at initial detection • Source activity at final detection (on or off) • Exclusion zone size during detection (meters) • Animal inside or outside the exclusion zone • Closest distance to vessel (reticle distance in meters) • Time at closest approach (UTC HH:MM) • Time animal entered exclusion zone (UTC HH:MM) • Time animal left exclusion zone (UTC HH:MM) • If observed/detected during ramp up/power up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection • Shut-down or power-down occurrences • Detections with PAM **Monitoring Effort Information for Pile Driving** • Date • Effort (ON=source on; OFF=source off)		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• If visual, number of PSOs on watch at one time • PSO name(s) (Last, First) • Start time of observations • End time of observations • Duration of visual observation • Wind speed (knots), from direction • Swell (meters) • Water depth (meters) • Visibility (kilometers) • Glare severity • Block name and number • Location: Latitude and Longitude		
39.	Construction, Operations	Monthly reporting for protected species	The applicant will provide monthly Excel format reports on geological and geophysical surveys including the data fields specified below. These reports must be submitted by the PSO provider on the 15th of each month for each vessel until the last reporting period for a survey. Any editing, review, and quality assurance checks must only be completed by the PSO provider prior to submission. These data may be generated through software applications or otherwise recorded electronically by PSOs. Applications developed to record PSO data are encouraged as long as the data fields listed below can be recorded and exported to Excel. Alternatively, BOEM has developed an Excel spreadsheet with all the necessary data fields available upon request. Final reports should be submitted by the applicant in coordination with PSO providers 90 days following completion of a survey. Final reports must contain departure and return ports, PSO names and training certifications, the PSO provider contact information, dates of the survey, a vessel track, a summary of all PSO sightings, shutdowns that occurred, vessel strike-avoidance measures taken, takes that occurred, and any injured or dead protected species that were observed. PSOs must be approved by NMFS prior to the start of a survey. Application requirements to become a NMFS-approved PSO for geological and geophysical surveys can be obtained by sending an inquiry to nmfs.psoreview@noaa.gov. PSO names and training must be provided in all reports and the applicant must provide to BOEM, upon request, documentation of NMFS approval for individual PSOs. **Project Information for Surveys** • Project name • Lease number • State coastal zones • Survey contractor • Vessel name • Survey type (typically HRG) • Reporting start and end dates • Sound sources including equipment type, power level, and frequencies used • Greatest root mean squared source level • Visual monitoring equipment used (e.g., bionics, magnification, infrared cameras, etc.) • Distance-finding method used • PSO names and training • Observation height above sea surface **Operations Information for Surveys** • Date • Time pre-exclusion visual monitoring began in UTC (HH:MM) • Time pre-exclusion monitoring ended in UTC (HH:MM) • Duration of pre-exclusion visual monitoring • Day or night pre-exclusion • Time power up/ramp up began • Time equipment full power was reached • Duration of power up/ramp up • Time survey activity began (equipment on) • Time survey activity ended (equipment off) • Duration of activity • Shutdown/power-down occur (Y/N) • Time shutdown was called for (UTC) • Time equipment was shut down (UTC) • Vessel positions must be logged every 30 seconds • Record any habitat or prey observations	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Record any marine debris sighted **<u>Detection Information for Protected Species</u>** • Date (YYYY-MM-DD) • Sighting ID (V01, V02, or sequential sighting number for that day; multiple sightings of same animal or group should use the same ID) • Date and time at first detection in UTC (YY-MM-DDT HH:MM) • Time at last detection in UTC (YY-MM-DDT HH:MM) • PSO name(s) (Last, First) • Effort (ON=source on; OFF =source off) • Latitude (decimal degrees dd.ddddd), Longitude (decimal degrees dd.ddddd) • Compass heading of vessel (degrees) • Water depth (meters) • Swell height (meters) • Douglas sea scale • Precipitation • Visibility (kilometers) Cloud coverage (%) • Glare • Sightings including common name, scientific name, or Family • Certainty of identification • Number of adults • Number of juveniles • Total number of animals • Bearing to animal(s) when first detected (ship heading + clock face) • Range from vessel (reticle distance in meters) • Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) • Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) • Direction of travel/first approach (relative to vessel) • Behaviors observed: indicate behaviors and behavioral changes observed in sequential order • If any bow-riding behavior observed, record total duration during detection (HH:MM) • Initial heading of animal(s) (degrees) • Final heading of animal(s) (degrees) • Source activity at initial detection • Source activity at final detection (on or off) • Exclusion zone size during detection (meters) • Animal inside or outside the exclusion zone • Closest distance to vessel (reticle distance in meters) • Time at closest approach (UTC HH:MM) • Time animal entered exclusion zone (UTC HH:MM) • Time animal left exclusion zone (UTC HH:MM) • If observed/detected during ramp up/power up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection • Shutdown or power-down • Detected with infrared (Y/N) **<u>Monitoring Effort Information for Surveys</u>** • Date • Effort (ON=source on; OFF=source off) • If visual, number of PSOs on watch at one time • PSO name(s) (Last, First) • Start time of observations • End time of observations • Duration of visual observation • Wind speed (knots), from direction • Swell (meters) • Water depth (meters) • Visibility (kilometers)		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Glare severity • Block name and number • Location: Latitude and Longitude		
40.	Construction, Operations, Decommissioning	Vessel crew training requirements	The applicant will provide Project-specific training for all vessel crew prior to the start of in-water construction activities. Confirmation of the training and understanding of the requirements must be documented on a training course log sheet. The log sheets must be provided to BOEM and NMFS upon request. All vessel crewmembers must be briefed in the identification of sea turtles and marine mammals and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all proposed Project vessels for identification of sea turtles and marine mammals. The expectation and process for reporting of sea turtles and marine mammals (including live, entangled, and dead individuals) must be clearly communicated and posted in highly visible locations aboard all proposed Project vessels; there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain) and a communication channel and process for crew members.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BOEM BSEE
41.	Construction	Daily pre-construction surveys	The applicant will conduct PAM and visual surveys each day before pile driving begins to establish the numbers, surface presence, behavior, and travel directions of protected species in the area. These surveys will follow standard protocols and data collection specified by BOEM. In addition to standard daily surveys, the applicant must include an enhanced survey plan for November through December and May 1 through May 31 to minimize risk of exposure of NARWs to pile-driving noise that includes daily pre-construction surveys.	Marine Mammals (3.7); Sea Turtles (3.8)	NOAA
42.	Construction	Submittal of raw field data collection of marine mammals and sea turtles in the pile-driving exclusion zone	If a marine mammal or sea turtle in the exclusion zone results in a shutdown or a power-down, the applicant must report the event to BOEM within 24 hours at renewable reporting@boem.gov. In addition, the data report, which is the raw data collected in the field, must be submitted by the PSO provider and include the daily form, including the date, time, species, pile identification number, global positioning system coordinates, time and distance of the animal when sighted, time the shutdown or power-down occurred, behavior of the animal, direction of travel, time the animal left the exclusion zone, time the pile driver was restarted or powered back up, and any photographs that may have been taken. This data report must be submitted to BOEM at renewable_reporting@boem.gov monthly on the 15th day of each month for the previous calendar month of activities.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
43.	Construction, Operations	PSO and reporting requirements for pile driving	PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to adequately monitor the area of the exclusion zone and as defined in NMFS's BO and the final LOA (once issued). Daily PSO forms, including electronic effort, survey, and sightings forms, must be submitted to BOEM at renewable_reporting@boem.gov monthly on the 15th day of each month for the previous calendar month of activities. Required data and reports may be archived, analyzed, published, and disseminated by BOEM. **Detection Information for Protected Species** • Date (YYYY-MM-DD) • Sighting ID (V01, V02, or sequential sighting number for that day) (multiple sightings of same animal or group should use the same ID) • Date and time at first detection in UTC (YY-MM-DDT HH:MM) • Time at last detection in UTC (YY-MM-DDT HH:MM) • PSO name(s) (Last, First) • Effort (ON=source on; OFF=source off) • Latitude (decimal degrees dd.ddddd), Longitude (decimal degrees dd.ddddd) • Compass heading of vessel (degrees) • Water depth (meters) • Swell height (meters) • Douglas sea scale • Beaufort scale • Precipitation • Visibility (kilometers) • Cloud coverage (%) • Glare • Sightings including common name, scientific name, or family • Certainty of identification • Number of adults • Number of juveniles • Total number of animals • Bearing to animal(s) when first detected (ship heading + clock face) • Range from vessel (reticle distance in meters) • Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) • Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) • Direction of travel/first approach (relative to vessel) • Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes) • If any bow-riding behavior observed, record total duration during detection (HH:MM) • Initial heading of animal(s) (degrees)	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM NMFS NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Final heading of animal(s) (degrees) • Source activity at initial detection • Source activity at final detection (on or off) • Exclusion zone size during detection (meters) • Animal inside or outside the exclusion zone • Closest distance to vessel (reticle distance in meters) • Time at closest approach (UTC HH:MM) • Time animal entered exclusion zone (UTC HH:MM) • Time animal left exclusion zone (UTC HH:MM) • If observed/detected during ramp up/power up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection • Shut-down or power-down occurrences • Detections with PAM **Monitoring Effort Information for Pile Driving** • Date • Effort (ON=source on; OFF=source off) • If visual, number of PSOs on watch at one time • PSO name(s) (Last, First) • Start time of observations • End time of observations • Duration of visual observation • Wind speed (knots), from direction • Beaufort scale • Swell (meters) • Douglas sea scale • Water depth (meters) • Visibility (kilometers) • Glare severity • Block name and number • Location: latitude and longitude		
44.	Construction, Operations, Decommissioning	Injured/protected species reporting	The applicant will report immediately any observation of potential takes, strikes, or dead/injured protected species, regardless of the cause, to the NMFS Protected Resources Division, PR.ITP.MonitoringReports@noaa.gov and nmfs.gar.incidental-take@noaa.gov; NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622); and BOEM at renewable_reporting@boem.gov. In the event that an injured or dead marine mammal or sea turtle is sighted, the applicant must report the incident to NMFS Protected Resources Division, PR.ITP.MonitoringReports@noaa.gov and nmfs.gar.incidental-take@noaa.gov; NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622); and BOEM at renewable_reporting@boem.gov as soon as feasible but no later than 24 hours from the sighting. The report must include the following information: (1) time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); (2) species identification (if known) or description of the animal(s) involved; (3) condition of the animal(s) (including carcass condition if the animal is dead); (4) observed behaviors of the animal(s), if alive; (5) if available, photographs or video footage of the animal(s); and (6) general circumstances under which the animal was discovered. Staff responding to the hotline call will provide any instructions for handling or disposing of any injured or dead animals by individuals authorized to collect, possess, and transport sea turtles. In the event of a suspected or confirmed vessel strike of a sea turtle by any proposed Project vessel, the applicant must report the incident to NMFS Protected Resources Division, incidental.take@noaa.gov; NOAA Fisheries 24-hour Stranding Hotline (866-755-6622); and BOEM at renewable_reporting@boem.gov as soon as feasible. The report must include the following information: (1) time, date, and location (latitude/longitude) of the incident; (2) species identification (if known) or description of the animal(s) involved; (c) vessel's speed during and leading up to the incident; (4) vessel's course/heading and what operations were being conducted (if applicable); (5) status of all sound sources in use; (6) 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; (7) environmental conditions (e.g., wind speed and direction, Beaufort scale, cloud cover, visibility) immediately preceding the strike; (8) estimated size and length of animal that was struck; (9) description of the behavior of the animal immediately preceding and following the strike; (11) 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 (12) to the extent practicable, photographs or video footage of the animal(s). In addition, any occurrence of dead non-ESA-listed fish of 10 or more individual fish within established exclusion or monitoring zones must also be reported to BOEM at renewable_reporting@boem.gov as soon as feasible.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BSEE
45.	Construction, Operations, Decommissioning	Vessel observer requirements	The applicant must ensure that vessel operators and crew maintain a vigilant watch for marine mammals or sea turtles by slowing down, altering course, or stopping the vessel to avoid striking marine mammals or sea turtles. Vessel personnel must be provided an Atlantic reference guide that includes and helps identify marine mammals and sea turtles that may be encountered in the proposed Project area and material regarding NARW SMAs, sightings information, and reporting. When not on active watch duty, members of the monitoring team must consult NMFS' NARW reporting systems for the presence of NARWs in the proposed Project area. A visual observer aboard the vessel must monitor a	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			vessel strike-avoidance zone around the vessel. All vessels transiting to and from the SWDA and traveling over 10 knots must have a visual observer on duty at all times. The applicant must also have a trained lookout on all vessels during all stages of the proposed Project between June 1 and November 30 to observe for sea turtles and communicate with the captain to take required avoidance measures as soon as possible if one is sighted. If a vessel is carrying a visual observer for the purposes of maintaining watch for NARWs, an additional lookout is not required, and this visual observer must maintain watch for whales and sea turtles. If the trained lookout is a vessel crewmember, this must be their designated role and primary responsibility while the vessel is transiting. Any designated crew observers should be trained in the identification of sea turtles and in regulations and best practices for avoiding vessel collisions. The trained lookout must monitor seaturtlesightings.org prior to each trip and report any observations of sea turtles in the vicinity of the planned transit to all vessel operators/captains and lookouts on duty that day.		
46.	Construction, Operations, Decommissioning	Vessel speed requirements in SMAs	All vessels regardless of size must comply with the 10-knot speed restriction in any SMA (NOAA 2022).	Marine Mammals (3.7); Sea Turtles (3.8)	NOAA
47.	Construction, Operations, Decommissioning	Vessel communication of threatened and endangered species sightings	Whenever multiple proposed Project vessels are operating, the applicant will communicate any visual observations of any marine mammal or sea turtle to a PSO or vessel captains associated with other proposed Project vessels. Furthermore, 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.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
48.	Construction, Operations	Visual monitoring during UXO detonations (vessel-based)	The applicant will comply with a modified visual monitoring measure for UXO detonations: • At least four PSOs must be actively observing marine mammals before and after any UXO/MEC detonation. At least two PSOs must be stationed and observing on a vessel as close as possible to the detonation site and at least two PSOs must be stationed on a secondary, PSO-dedicated vessel or aerial platform. Concurrently, at least one acoustic monitoring PSO (i.e., PAM operator) must be actively monitoring for marine mammals with PAM before, during, and after detonation.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BOEM BSEE
49.	Construction, Operations	PAM during UXO detonations	BOEM will require that the applicant comply with applicant-proposed measures for UXO detonations, and the dedicated PAM PSO must acoustically monitor to a minimum radius of 8.8 miles (14.1 kilometers) around the detonation site.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BOEM BSEE
50.	Construction, Operations	UXO Clearance zones	BOEM will require the applicant comply with applicant-proposed measures, and BOEM will require that a 5,249-foot (1,600-meter) sea turtle clearance zone be established.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BOEM BSEE
51.	Construction, Operations, Decommissioning	Marine mammal and sea turtle geophysical survey exclusion zones	For sparkers and similar sub-bottom profiler equipment operating below 180 kHz or within the hearing ranges of each hearing group (excluding the Innomar), minimum exclusion zone distances for ESA-listed species of marine mammals and sea turtles must be monitored at all times and be demarcated within the watch zone with effective distance-finding methods (e.g., reticle binoculars, range-finding sticks, monitoring system software). A 1,640-foot watch zone will be established in every direction around each survey vessel. All threatened and endangered species within this distance will be monitored by a third-party PSOs. A 656-foot exclusion zone must be established around each survey vessel for endangered and threatened marine mammals and sea turtles. Exclusion zones for non-ESA-listed marine mammals must be followed as required by NMFS through proposed Project-specific mitigation and monitoring requirements of ITAs. If an ITA is not required, the applicant must monitor default exclusion zones of 328 feet (100 meters) for all non-listed marine mammals. The exclusion zones must be established within the watch zone with accurate distance-finding methods (e.g., reticle binoculars, range-finding sticks, calibrated video cameras, and software). If the exclusion zones cannot be adequately monitored for animal presence (i.e., a PSO determines conditions are such that ESA-listed species cannot be reliably sighted within the exclusion zones), the survey must be stopped until such time that the exclusion zones can be reliably monitored. This monitoring must be carried out by approved PSOs (see specific details on PSO requirements below). For marine mammals, these requirements are for sound sources that are operating within the hearing range of marine mammals (below 180 kHz).	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
52.	Construction, Operations, Decommissioning	Geophysical survey off-effort PSO monitoring	During good daylight conditions during periods when survey equipment is not operating (e.g., daylight hours; Douglas sea state scale 3 or less), to the maximum extent practicable, visual PSOs must conduct observations for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
53.	Construction, Operations, Decommissioning	Geophysical survey vessel whale strike-avoidance and equipment shutdown protocols	Avoidance measures must occur for listed whales or any other unidentified whale sighted within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard) at a distance of 1,640 feet (500 meters) or less from a survey vessel. PSOs must notify the vessel captain of any whale within 1,640 feet (500 meters) of vessel within this area. The vessel captain must immediately implement strike-avoidance procedures to maintain a separation distance of 1,640 feet (500 meters) from listed whales including changing vessel direction or reducing vessel speed to allow the animal to travel away from the vessel. Any time a listed species (sea turtles, whales, and manta rays) is within a 656-foot (200 meters) avoidance zone in any direction around a survey vessel, PSOs must notify the vessel captain that a full stop is required if safety permits. The PSO must also notify the resident engineer that a shutdown of all active sparker sources below 180 kHz is immediately required. The vessel operator and crew must comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion must occur only after shutdown.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
54.	Construction, Operations, Decommissioning	Periodic underwater surveys, reporting, and monofilament and other fishing gear cleanup around WTG foundations	The applicant will monitor indirect impacts associated with charter and recreational gear lost from expected increases in fishing around WTG foundations. Surveys by remotely operated vehicles, divers, or other means will inform frequency and locations of debris removal to decrease ingestion by and entanglement of marine species. The results of the surveys will be reported to BOEM (renewable_reporting@boem.gov) by April 30 for the preceding calendar year in which the survey is performed. Reports will be submitted in Word format. Photographic and videographic materials will be provided on a drive in a lossless format such as TIFF or Motion JPEG 2000. Reports will include daily survey reports that include the date, contact information of the operator, location and pile identification number, photographic and/or video documentation of the survey and debris encountered, any animals sighted, and the disposition of any located debris (i.e., removed or left in place). Required data and reports may be archived, analyzed, published, and disseminated by BOEM.	Marine Mammals (3.7); Sea Turtles (3.8); Birds (G.2.4)	BOEM BSEE
55.	Construction, Operations, Decommissioning	Sea turtles avoidance and exclusion zones during geophysical surveys	Vessel operators and crews must maintain a vigilant watch for all protected marine species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any ESA-listed species. The presence of a single species at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised. A visual observer aboard the vessel must monitor a vessel strike-avoidance zone (species-specific distances detailed below) around the vessel according to the parameters stated below to ensure the potential for strike is minimized. Minimum exclusion zone distances for ESA-listed sea turtles must be monitored at all times and demarcated within the watch zone with effective distance-finding methods (e.g., reticle binoculars, range-finding sticks, monitoring system software). A 1,640-foot watch zone will be established in every direction around each survey vessel. All threatened and endangered species within this distance will be monitored by third-party PSOs and survey operations and listed species data recorded. A 656-foot exclusion zone must be established around each survey vessel for endangered and threatened sea turtles. The exclusion zone is the distance within which vessel avoidance measures to maintain a distance of 656-feet (200 meters) or greater is not possible, and a sparker or boomer source must be shut down. Exclusion zone requirement applies when a sound source is used within the hearing range of sea turtles. Survey vessel crewmembers responsible for navigation duties must receive site-specific training on ESA-listed species sighting/reporting and vessel strike-avoidance measures. Visual observers monitoring the vessel strike-avoidance zone can be either third-party PSOs or crewmembers, but crewmembers responsible for these duties must be provided sufficient training to distinguish ESA-listed species to broad taxonomic groups and have no other responsibilities during the time of observation. If the exclusion zones cannot be adequately monitored for animal presence (i.e., a PSO determines conditions are such that ESA-listed species cannot be reliably sighted within the exclusion zones), the survey must be stopped until such time that the exclusion zones can be reliably monitored. This monitoring must be carried out by NMFS-approved PSOs.	Sea Turtles (3.8)	BOEM BSEE
56.	Construction	Pile-driving monitoring plan and PSO reporting requirements for sea turtles	The applicant will submit a pile-driving monitoring plan to BOEM and NMFS for review and approval a minimum of 90 days prior to the commencement of pile-driving activities. The plan must: • Confirm that the full extent of the harassment distances (175 dB root mean squared) from piles are monitored for sea turtles to ensure that all potential take is documented; • Include (1,640 feet (500 meters)) exclusion zones and exclusion zone modification protocols and approvals required; • Include number of PSOs and/or Native American monitors that will be used, the platforms and/or vessels upon which they will be deployed, and contact information for the PSO provider(s); and • Include measures for enhanced monitoring capabilities if poor visibility conditions unexpectedly arise, and pile driving cannot be stopped. The plan may also include deploying additional observers and using night vision goggles with the goal of ensuring the ability to maintain all exclusion zones in the event of unexpected poor visibility conditions. A communication plan detailing the chain of command, mode of communication, and decision authority must be described. PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to adequately monitor the area of the exclusion zone. Daily PSO forms, including electronic effort, survey, and sightings forms, must be submitted to BOEM at renewable_reporting@boem.gov monthly on the 15th day of each month for the previous calendar month of activities. Required data and reports may be archived, analyzed, published, and disseminated by BOEM.	Sea Turtles (3.8)	NMFS NOAA BSEE
57.	Construction	Pile-driving noise reporting and clearance zone adjustment for sea turtles	Before driving any additional piles following underwater noise measurements, the applicant must review the initial field measurement results and make any necessary adjustments to the sound attenuation system and/or the sea turtle exclusion or monitoring zones as detailed below. If the initial field measurements indicate that the isopleths of concern are larger than those considered, in coordination with BOEM, NMFS, and USACE, the applicant must ensure that additional sound attenuation measures are in place before additional piles are installed. Additionally, the exclusion and monitoring zones must be expanded to match the actual distances to the isopleths of concern. If the exclusion zones are expanded beyond 1.5 kilometers (0.9 mile), additional observers must be deployed on additional platforms, with each observer responsible for maintaining watch in no more than 180 degrees an area with a radius no greater than 1.5 kilometers (0.9 mile). The applicant must provide the initial results of the field measurements to NMFS, BOEM, and USACE as soon as they are available; NMFS, BOEM, and USACE will discuss these as soon as feasible with a target for that discussion within 2 business days of receiving the results. BOEM and NMFS will provide direction to the applicant on whether any additional modifications to the sound attenuation system or changes to the exclusion or monitoring zones are required. BOEM must also discuss the potential need for re-initiation of consultation, if appropriate, with NMFS.	Sea Turtles (3.8)	NMFS BSEE
58.	Construction	Pile-driving exclusion zones (no-go zones) for sea turtles	To ensure that pile-driving operations are carried out in a way that minimizes the exposure of listed sea turtles to noise that may result in injury or behavioral disturbance, PSOs will establish a 1,640-foot (500-mile) exclusion zone for all pile-driving activities.	Sea Turtles (3.8)	NMFS BSEE
59.	Construction, Operations, Decommissioning	Vessel strike avoidance of sea turtles (non-geophysical survey vessels)	During all phases of the proposed Project, Project vessel operators and crews must maintain a vigilant watch for all sea turtles and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any sea turtles as long as it is safe to do so. All vessels must maintain a minimum separation distance of 328 feet (100 meters) from sea turtles whenever possible. Trained crew lookouts must monitor seaturtlesightings.org daily and prior to each trip to note and report any observations of sea turtles in the vicinity of the planned transit to all vessel operators and captains and lookouts on duty that day. If a sea turtle is sighted within 328 feet (100 meters) of the operating vessels' forward path, the vessel operator must slow down to 4 knots (unless unsafe to do so) and may resume normal vessel operations once the vessel has passed the sea turtle. If a sea turtle is sighted within 164 feet (50 meters) of the forward path of the operating vessel, the vessel operator must shift to neutral when safe to do so and then proceed away from the turtle at a speed of 4 knots or less until there is a separation distance of at least 328 feet (100 meters) at which time normal vessel operations may be resumed. Between June 1 and	Sea Turtles (3.8)	NMFS BSEE

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			November 30, vessels must avoid transiting through areas of visible jellyfish aggregations or floating vegetation lines or mats. In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas.		
60.	Construction, Operations, Decommissioning	Geophysical survey exclusion zone, power-up, and restart procedures	The applicant will apply the following limitations and conditions to geophysical surveys: • At the beginning of each survey, active acoustic sound sources operating at less than 200 kHz must not activated until a PSO has verified the 656-foot pre-survey exclusion zones to be clear of all sea turtles for a full 30 minutes. Any time a sea turtle is sighted within the exclusion zone, the PSO will require the resident engineer or other authorized individual to shut down the survey equipment if power-up procedures have started. The vessel operator must comply immediately with any call for a shutdown by the PSO. Any disagreement should be discussed only after shutdown. • At full power, a shutdown of sparker equipment must occur any time a sea turtle is sighted within 164 feet (50 meters) of the vessel. Following a shutdown for any reason or when sea turtles are sighted within 164 feet (50 meters) of the survey vessel, ramp up of the equipment may begin immediately only if visual monitoring of the exclusion zone continues throughout the shutdown and all animals are confirmed by PSOs to be outside of the exclusion zone throughout the shutdown. All shutdowns of geophysical survey equipment due to protected species sightings that are not re-sighted require the 30-minute clearance period before ramp-up procedures.	Sea Turtles (3.8)	BOEM BSEE
61.	Operations	Post-installation cable monitoring	The applicant must provide BOEM and NOAA with a cable monitoring report within 90 calendar days following each inter-array and export cable inspection to determine cable location, burial depths, state of the cable, and site conditions. An inspection of the inter-array cable and export cable is expected to include HRG methods, such as a multi-beam bathymetric survey equipment, and identify seabed features, natural and human-made hazards, and site conditions along federal sections of the cable routing. In federal waters, the initial inter-array and export cable inspection will be carried out within 6 months of commissioning, and subsequent inspections will be carried out at years 1, 2, and every 3 thereafter, and after a major storm event. Major storm events are defined as when metocean conditions at the facility meet or exceed the 1 in 50-year return period calculated in the metocean design basis, to be submitted to BOEM with the facility design report. Post-storm surveys will be focused on areas of concern following an analysis of the DTS or equivalent data. If conditions warrant adjustment to the frequency of inspections following the Year 2 survey, a revised monitoring plan may be provided to BOEM for review. In addition to inspection, the export cable will be monitored continuously with the as-built DTS or equivalent system. If data indicate that burial conditions have deteriorated or changed significantly and remedial actions are warranted a seabed stability analysis, and report of remedial actions taken or scheduled must be provided to BOEM within 45 calendar days of the observations. The DTS or equivalent data, cable monitoring survey data, and cable conditions analysis for each year must be provided to BOEM as part of the annual compliance reports, required by 30 CFR § 585.633(b).	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE
62.	Construction, Operations, Decommissioning	Fisheries compensation program	The applicant will implement the following compensation programs consistent with BOEM's draft guidance for mitigating impacts on commercial fisheries and for-hire recreational fishing): • A gear loss and damage compensation program to address the impact-producing factor for presence of structures during construction, operations, and decommissioning by reducing impacts resulting from loss of gear associated with uncharted obstructions resulting from the proposed Project. • A compensation program for lost income from commercial fisheries and for-hire recreational fishing activities and other eligible fishing interests for lost income during construction and a minimum of 5 years post-construction. o The applicant shall establish a compensation/mitigation fund (Fund) consistent with BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 (Guidance) to compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity resulting from displacement from fishing grounds due to project construction and operations and to shoreside businesses for losses indirectly related to the Project. For losses to commercial and for-hire recreational fishermen, the Fund shall be based on the revenue exposure for fisheries based out of ports listed in Table 3.9-6: Average Annual Revenue from the Southern Wind Development Area for Most Impacted Ports, 2008–2021. For losses to shoreside businesses, the applicant shall analyze the impacts to shoreside seafood businesses adjacent to ports listed in Table 3.9-6.	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE
63.	Construction, Operations	Trawl-friendly cable protection design	The applicant will design cable protection measures to reflect the existing conditions at the site and specifically avoid introducing new hangs for mobile fishing gear by making cable protection measures "trawl-friendly" with tapered/sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, the applicant will use materials that mirror that benthic environment, including rock placement or a gabion system.	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE
64.	Construction, Operations, Decommissioning	Daily two-way communication during construction	The applicant will establish clear daily two-way communication channels between fishermen and the proposed Project Marine Coordinator (or suitable surrogate) during construction. The applicant will be responsible for ensuring this applies to contractors and sub-contractors.	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	NMFS
65.	Construction, Operations	Trawl survey for finfish and squid	To support a before-after control impact analysis, sampling will occur before, during, and 1 year after construction both within the proposed Project footprint, as well as at control sites. A total of 50 tows, 25 in the proposed Project area and 25 in control areas, will be conducted seasonally during spring (April through June), summer (July through September), fall (October through December) and winter (January through March) (four times per year). The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Other Uses (3.14)	NMFS BSEE
66.	Construction, Operations	Ventless trap surveys	The applicant will conduct a stratified random ventless lobster trap survey to sample American lobster (*Homarus americanus*), Jonah crab (*Cancer borealis*), and black sea bass (*Centropristis striata*) in the lease area and control area during May through December. Thirty strings split between the control and development areas will be deployed, with six traps per string alternating vented and ventless. A single fish pot will be added to each string of lobster traps to collect general information on black sea bass, as well as their predation rates on lobsters. A mark-recapture tagging study and neuston sampling will also occur in coordination with the ventless trap sampling. There will be 15 sampling sites in	Commercial Fisheries and For-Hire	NMFS BSEE

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			the study area and 15 in the control area, for a total of 30 stations. Each location will be sampled two times per month. To the degree possible, survey gear will be hauled on a 3-day soak time, in the attempt to standardize catchability among trips. To avoid entanglement with vertical lines, buoy lines will be weighted and will not float at the surface of the water, and all groundlines will consist of sinking line. Buoy lines and linkages will be compliant with best practices. Ropeless gear may be tested and used. All buoys will be properly labeled with the scientific permit number and identification as research gear.	Recreational Fishing (3.9); Other Uses (3.14)	
67.	Construction	Conduct additional investigations of any previously identified submerged landform features that cannot be avoided	The applicant will fund a mitigation plan to resolve impacts on the unavoidable submerged landform features identified during marine archaeological surveys of the SWDA and OECC that remain in the area of potential effects. The mitigation plan will include collection of up to two additional vibracores in each of the unavoidable submerged landform features; laboratory analyses of subsamples collected from the cores where terrestrial soils were identified (Carbon 14 dating, bulk geochemical analysis of nitrogen, pollen analysis, and microdebitage analysis); and a professional report of results suitable for technical audiences. Tribal representatives will have the opportunity to be present for all stages of work, including core collection, core opening, and core sub-sampling. The mitigation plan will also include the development of educational and documentary materials, including PowerPoint presentations prepared for a non-technical audience, digital geodatabase in ArcGIS documenting the landform features and the study activities (known boundaries of landforms, core locations), assistance to tribes in configuring their own geographic information system software on their own computers, and an in-person presentation on the study prepared for non-technical audience.	Cultural Resources (3.10)	BOEM BSEE
68.	Construction	Avoid or investigate submerged potential historic properties identified as a result of future marine archaeological resources identification surveys	The applicant will avoid or investigate potential submerged archaeological resources identified as a result of future marine archaeological resources identification surveys that will be performed in any portions of the area of potential effects not previously surveyed, including: • Any *potential archaeological resource* (i.e., one or more geophysical survey anomalies or targets with the potential to be an archaeological resource) will be avoided. If avoidance is not possible, the anomaly or target will be assessed to BOEM's satisfaction using industry-standard ground-truthing techniques to determine whether it constitutes an identified archaeological resource. • Any *identified archaeological resource* will be avoided. If avoidance is not possible, additional investigations will be performed to determine eligibility for listing in the National Register of Historic Places. • Any *submerged landform features* that may be contributing elements to the Nantucket Sound traditional cultural property or are outside the boundaries of the Nantucket Sound traditional cultural property and are considered contributing elements to a cultural landscape will be avoided or additional mitigations will be required for resolving adverse effects pursuant to 36 CFR § 800.6. If avoidance is not possible, each unavoidable landform feature will be subject to the same mitigation plan and will be used to resolve effects to the known unavoidable submerged landform features to conduct additional investigations and development of educational and documentary materials, as discussed above. • Any *archaeological resources determined eligible for listing on the National Register of Historic Places* (i.e., historic properties) will be avoided or subjected to a Phase III data recovery plan, pursuant to 36 CFR § 800.6.	Cultural Resources (3.10)	BOEM BSEE
69.	Construction	Onshore archaeological monitoring	The applicant will provide archaeological monitoring during onshore construction in areas identified as having high or moderate archaeological sensitivity and implement a terrestrial post-review discoveries plan to reduce potential impacts on any previously undiscovered archaeological resources (if present) encountered during construction by preventing further physical impacts on the archaeological resources.	Cultural Resources (3.10)	BOEM BSEE
70.	Construction, Operations, Decommissioning	Environmental data sharing with federally recognized Native American tribes	The applicant will share with federally recognized Native American tribes with which it is engaged in government-to-government consultation on the proposed Project (unless a tribe specifically requests not to receive the information) the data and reports generated as a result of the benthic monitoring plan; optical surveys of benthic invertebrates and habitat; evaluation of additional benthic habitat data in Muskeget Channel prior to cable lay operations; PAM; trawl survey for finfish and squid; reporting of all NARW sightings; injured/protected species reporting; NARW PAM monitoring; reporting of marine mammals and sea turtles in the pile-driving exclusion zone; PSO elements of weekly and monthly pile-driving reports; monthly construction summaries, including pile-driving reports; PSO and reporting requirements for pile driving; monthly reporting for protected species; vessel strike reporting for sea turtles; and other injured/dead protected species reporting. The federally recognized tribes with which the data and reports must be shared include, but are not limited to, the Delaware Nation; the Delaware Tribe of Indians; the Mashantucket (Western) Pequot Tribal Nation; the Mashpee Wampanoag Tribe of Massachusetts; the Mohegan Tribe of Indians of Connecticut; the Narragansett Tribe; the Shinnecock Indian Nation; and the Wampanoag of Gay Head (Aquinnah).	Cultural Resources (3.10)	Federally recognized Native American tribes BSEE
71.	Construction, Operations, Decommissioning	Coordination with federally recognized Native American tribes in local hiring plan	The applicant will coordinate with federally recognized Native American tribes in the local hiring plan to facilitate its direct hiring of members of federally recognized Native American tribes, when possible and appropriate.	Cultural Resources (3.10); Environmental Justice (3.12)	Federally recognized Native American tribes BSEE
72.	Construction	Engagement with federally recognized Native American tribes regarding fishing compensation, trust, and innovation funds	The applicant will develop and implement an engagement plan to increase awareness of and potential participation in proposed commercial fishery and other compensation funds among environmental justice communities, including federally recognized Native American tribes. The applicant will be required to host at least one outreach event, held virtually online or in person, with each of the federally recognized Native American tribes that are interested and eligible, based on geographic location, to participate in the listed programs.	Cultural Resources (3.10); Environmental Justice (3.12)	Federally recognized Native American tribes BSEE
73.	Construction, Operations, Decommissioning	Local hiring plan	The applicant will prepare and implement a local hiring plan to maximize its direct hiring of residents of southeastern Massachusetts and Connecticut. Components of the plan will include coordination with unions, training facilities, and schools.	Environmental Justice (3.12)	BOEM BSEE

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74.	Construction, Operations, Decommissioning	Submarine cable system burial plan	A copy of the submarine cable system burial plan, depicting the precise planned locations and burial depths of the entire cable system will be submitted by the applicant as part of its facility design report and fabrication and installation report. This plan will be reviewed by the USCG and BOEM. The USCG review will specifically address potential impacts on federal aids to navigation.	Navigation and Vessel Traffic (3.13)	USCG Recommended Mitigation 1c BSEE
75.	Construction	Boulder relocation reporting	The applicant will report the locations of any boulders (which protrude 6.5 feet [2 meters] or more above the sea floor) relocated during cable installation activities to BOEM, MassDEP, Massachusetts CZM, Rhode Island Coastal Resources Management Council, the USCG, NOAA, and the local harbormaster (if within a town's jurisdiction) within 30 days of relocation. These locations must be reported in latitude and longitude degrees to the nearest 10 thousandth of a decimal degree (roughly the nearest meter), or as precise as practicable.	Navigation and Vessel Traffic (3.13)	BOEM BSEE
76.	Construction, Operations, Decommissioning	Vessel safety practices	All proposed Project vessels involved in construction, operations, and decommissioning activities will comply with U.S. or International Convention for the Safety of Life at Sea standards, as applicable, with regard to vessel construction, vessel safety equipment, and crewing practices.	Navigation and Vessel Traffic (3.13)	USCG
77.	Construction, Operations, Decommissioning	WTG and ESP marking	The applicant will mark each WTG and ESP with PATONs, subject to the approval of the Commander (dpw-1), First Coast Guard District. The applicant will: • Provide BOEM, BSEE, and USCG with a proposed lighting, marking, and signaling plan, which must be approved by BOEM after consultation with the USCG. The plan should conform to the International Association of Marine Aids to Navigation and Lighthouse Authorities Recommendation O-139, The Marking of Man-Made Offshore Structures. Should any part of the recommendation conflict with federal law or regulation, or if the applicant seeks an alternative to the recommendation, the applicant must consult with the USCG. • Mark each individual WTG and ESP with clearly visible, unique, alphanumeric identification characters. • Light each WTG and ESP in a manner that is visible by mariners in a 360-degree arc around the WTG and ESP. • Apply to the First Coast Guard District to establish PATONs for the facility. Approval for all PATONs must be obtained before installation of structures begins. • Ensure each WTG is lighted with red obstruction lighting consistent with the Federal Aviation Administration Advisory Circular 70/7460-1L Change 2 (FAA 2018), so long as this requirement does not preclude the use of an aircraft detection lighting system. • Provide signage that covers 360 degrees of the wind turbine structures warning vessels of the air draft of the turbine blades as determined at highest astronomical tide. • Cooperate with the USCG and NOAA to ensure that cable routes and wind turbines are depicted on appropriate government produced and commercially available nautical charts. • Provide mariner information sheets on the applicant's website with details on the location of the turbines and specifics such as blade clearance above sea level.	Navigation and Vessel Traffic (3.13)	USCG BSEE
78.	Construction, Operations, Decommissioning	USCG training and exercises	The applicant will participate in periodic USCG-coordinated training and exercises to test and refine notification and shutdown procedures and to provide SAR training opportunities for USCG vessels and aircraft.	Navigation and Vessel Traffic (3.13)	USCG
79.	Construction, Operations, Decommissioning	Mooring attachments and access ladders	The applicant will place mooring attachments (for securing vessels) and access ladders for use in emergencies on each WTG and ESP foundation. Plans for the design and placement of access ladders will be submitted for USCG review and BSEE approval.	Navigation and Vessel Traffic (3.13)	USCG BSEE
80.	Construction, Operations, Decommissioning	Operations and maintenance plan	Prior to operations of the proposed Project, the applicant will submit a written plan for operations and maintenance, which includes control center(s), for review by BOEM, BSEE, and the USCG. The plan must demonstrate that the control center(s) will be adequately staffed to perform standard operating procedures, communications capabilities, and monitoring capabilities. The plan will include, but not be limited to, the following topics, which may be modified through ongoing discussions with the USCG and BSEE: • Standard Operating Procedures: This includes methods for establishing and testing WTG rotor shutdown; methods of lighting control; method(s) for notifying the USCG and BSEE of mariners in distress or potential/actual SAR incidents; method(s) for notifying the USCG and BSEE of any events or incidents that may impact maritime safety or security; and methods for providing the USCG and BSEE with environmental data, imagery, communications and other information pertinent to SAR or marine pollution response. • Staffing: This includes the number of personnel intended to staff the control center(s) to ensure continuous monitoring of WTG operations, communications, and surveillance systems. • Communications: These are the capabilities to be maintained by the control center(s) to communicate with the USCG, BSEE, and mariners within and in the vicinity of the proposed Project area. Communications capability will at a minimum include VHF marine radio and landline and wireless for voice and data. • Monitoring: The control center(s) should maintain the capability to monitor the applicant installation and operations in real time (including night and periods of poor visibility) for determining the status of all PATONs; searching for and locating mariners in distress upon notification of a maritime distress incident; and detection of a survivor who has climbed to the survivor's platform, if installed, on any WTG or ESP.	Navigation and Vessel Traffic (3.13)	USCG
81.	Construction, Operations, Decommissioning	WTG/ESP installation	No WTG/ESP installation work may commence at the proposed Project site (i.e., on or under the water) without prior review by BOEM, BSEE, and the USCG of a plan to be submitted by the applicant that describes the schedule and process for erecting each WTG, including all planned mitigations to be implemented to minimize any impacts on navigation while installation is ongoing. Appropriate Notice to Mariners submissions will accompany the plan.	Navigation and Vessel Traffic (3.13)	USCG BSEE

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82.	Construction, Operations, Decommissioning	USCG reporting	**Complaints**: On a monthly basis during installation, the applicant will provide the USCG with a description of any complaints received (either written or oral) by boaters, fishermen, commercial vessel operators, or other mariners regarding impacts on navigation safety allegedly caused by construction vessels, crew transfer vessels, barges, or other equipment. Describe any remedial action taken in response to complaints received. **Correspondence**: The applicant will provide copies of any correspondence received by the applicant from other federal, state, or local agencies that mention or address navigation safety issues to the USCG. **Maintenance schedule**: The applicant will provide its planned WTG maintenance schedule, forecast out to at least 1 quarter, to the USCG. Appropriate Notice to Mariners submissions will accompany each maintenance schedule.	Navigation and Vessel Traffic (3.13)	USCG
83.	Construction, Operations, Decommissioning	Public participation	To ensure sufficient opportunity for the public to receive information directly from the owners/operators of the wind energy facility, the applicant will attend periodic meetings of the Southeastern Massachusetts and Rhode Island Port Safety Forums to provide briefs on the status of construction and operations and on any problems or issues encountered with respect to navigation safety.	Navigation and Vessel Traffic (3.13)	USCG
84.	Construction, Operations, Decommissioning	Helicopter-landing platforms	If the applicant's ESPs include helicopter-landing platforms, those platforms will be designed and built to accommodate USCG HH60 rescue helicopters.	Navigation and Vessel Traffic (3.13)	USCG BSEE
85.	Construction, Operations, Decommissioning	AIS on all proposed Project construction and operations vessels, turbines, and ESPs	The applicant will ensure that all vessels associated with construction and operations of the proposed Project are installed with operational AIS to monitor the number of vessels and traffic patterns for analysis and compliance with vessel speed requirements.	Navigation and Vessel Traffic (3.13); Other Uses (3.14)	USCG BSEE
86.	Construction, Operations, Decommissioning	Department of Defense airspace and radar systems	The applicant will formally communicate agreement with the following provisions to de-conflict potential impacts on warning area W-105A, Nantucket ASR-9, and Falmouth ASR-8 radar systems and to address potential impacts of distributed acoustic sensing: • Acknowledge that structures can withstand the daily sonic overpressures (sonic booms) and potential falling debris from dispensing chaff and flare; • Confirm that the U.S. Air Force will not be held liable for any damage to property or personnel (Hold and Save Harmless clause); • Notify North American Aerospace Defense Command 30 to 60 days prior to proposed Project completion for radar adverse impact management scheduling; • Contribute $80,000 for radar adverse impact management execution; • Curtail of operations for national security or defense purposes as described in the leasing agreement; and • Coordinate with the Department of Defense and the U.S. Navy on any proposal to use distributed acoustic sensing as part of the proposed Project or associated transmission cables.	Other Uses (3.14)	Department of Defense
87.	Construction, Operations, Decommissioning	Mitigation for oceanographic high-frequency radars	To mitigate operational impacts on oceanographic high-frequency radars, the applicant will develop a plan with the NOAA Integrated Ocean Observing System Surface Currents Program for data sharing from turbine operators to include (a) sharing real-time telemetry of surface currents, waves, and other oceanographic data measured at locations in the proposed Project into the public domain; and (b) if needed by the Integrated Ocean Observing System Surface Currents Program to enhance mitigation, additional sharing of time-series of WTG blade rotation rates, nacelle bearing angles, and other information about the operational state of each of the proposed Project's turbines with high-frequency radar operators to aid interference mitigation.	Other Uses (3.14)	NOAA BOEM BSEE
88.	Construction, Operations, Decommissioning	Scientific survey mitigation	The applicant will fund and implement a mitigation program to address impacts from the proposed Project and potential cumulative impacts on recurring scientific surveys, including: • **Evaluation of survey designs**: Evaluate and quantify impacts of proposed Project-related wind development activities and potential cumulative impacts on scientific survey operations and on provision of scientific advice to management. • **Identification and development of new survey approaches**: Evaluate or develop appropriate statistical designs, sampling protocols, and methods, while determining if scientific data quality standards for the provision of management advice are maintained. • **Calibration of new survey approaches**: Design and carry out necessary calibrations and required monitoring standardization to ensure continuity, interoperability, precision, and accuracy of data collections. • **Development of interim provisional survey indices**: Develop interim ad hoc indices from existing non-standard data sets to partially bridge the gap in data quality and availability between pre-construction and operational periods while new approaches are being identified, tested, or calibrated. • **Wind energy monitoring to fill regional scientific survey data needs**: Apply new statistical designs and carryout sampling methods to effectively mitigate survey impacts due to offshore wind activities from the applicant operations for the operational life span of the proposed Project. • **Development and communication of new regional data streams**: Require new data collection, analysis, management, dissemination, and reporting systems. Changes to surveys and new approaches require substantial collaboration with fishery management, fishing industry, scientific institutions, and other partners.	Other Uses (3.14)	NOAA
89.	Operations	Web-based cameras	The applicant will install up to ten strategically placed web-based cameras that the USCG could potentially access to support a SAR event.	Navigation and Vessel Traffic (3.13)	USCG

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
90.	Construction, Operations, Decommissioning	Onshore lighting restrictions	The applicant will reduce lighting at onshore facilities, including, but not limited to, the use of the minimum number and intensity of lights necessary for safe nighttime operations and the use of full cut-off fixtures to prevent light from illuminating unnecessary areas. In addition, the applicant will submit a lighting plan specific to the proposed Phase 1 Substation on Shootflying Hill Road to ensure that lighting is shielded and directed to eliminate glare and spillover onto adjacent properties.	Scenic and Visual Resources (3.16); Land Use and Coastal Infrastructure (G.2.7)	BOEM BSEE
91.	Construction, Operations, Decommissioning	BSEE As-bult reports	The applicant will submit the following reports to BSEE (via TIMSWeb): • As-built anchoring reports, including anchor drop locations, anchor pick-up locations, estimated chain/line on the seafloor (including any line sweep), and maps of all that include representations of sensitive habitats to be avoided/impact minimized; • As-built reports for all dredging and cable installation documenting timing and methods used. Reports must include timing, anchor drop location, anchor pick-up location, estimated chain/line on the seafloor, any line sweep, and maps of all that include representations of sensitive habitats to be avoided/impact minimized; • As-built report of cable protection measures; • Trip reports for bi-annual optical survey work to confirm compliance; • Tri-annual scour protection reports, starting in Year 3, along with reports documenting any subsequent repair/modification of scour protection; • Trip reports for (May through October) bi-monthly plankton survey work; • Copies of pre-construction, construction, and post-construction fisheries surveys; • Copies of benthic monitoring reports (Measure 11) and reports on the analysis of benthic grabs and video transects; • Trawl survey reports; • Ventless trap survey reports; • Boulder relocation reporting; • Pile driving reports; and • Interim (monthly) and final PSO reporting.	Multiple	BSEE
92.	Operations	Bird mortality monitoring	Using a standardized protocol for the proposed Project, the applicant will document any dead or injured bats found on vessels and structures during construction, operations, and decommissioning. Reporting will occur within 5 to 10 business days of discovery. Handling of injured animals will occur in accordance with protocols developed by the applicant, USFWS, BOEM, and BSEE.	Birds (G.2.4)	BOEM BSEE USFWS
93.	Construction, Operations, Decommissioning	Dark sky lighting	Where safe and feasible, implement the National Park Service's Sustainable Outdoor Lighting Specifications (NPS 2022), including: • Use light-emitting diode fixtures that have a warm color hue (i.e., 2,700 Kelvin); • Use recessed and fully shielded (or "full cut off") light fixtures; • Do not use upward-facing lights; • Use fixtures that include or can accommodate timers, motion detectors, hue adapters, and dimmers; and • Use fixtures with the lowest lumens (light output) possible.	Cultural Resources (3.10); Scenic and Visual Resources (3.16); Land Use and Coastal Infrastructure (G.2.7)	BOEM BSEE
94.	Operations	Structure micro-siting	The applicant must not adjust approved structure locations in a way that narrows any northwest-to-southeast or northeast-to-southwest transit corridors to less than 0.6 nautical mile (0.7 mile). The applicant must not co-locate ESPs at approved structure locations by adding more than one foundation at an approved location.	Navigation and Vessel Traffic (3.13)	BOEM BSEE USCG
95.	Construction, Operation	Western Muskeget Variant Contingency Option	Use of the Western Muskeget Variant Contingency Option (i.e., Alternative B, Scenario 2) would require a written justification from the applicant to BOEM that use of the Western Muskeget Variant is necessary to preserve Project viability. BOEM would evaluate the need for exercising the contingency option to preserve project viability prior to granting any approvals to exercise the option.	Benthic Resources (3.4); Finfish, Invertebrates, and Essential Fish Habitat (3.6); Marine Mammals (3.7); Sea Turtles (3.8); Commercial and Recreational For-Hire Fisheries (3.9); Cultural Resources (3.10)	BOEM BSEE NMFS
96.	Construction, Operations, Decommissioning	Avian and bat monitoring program	At least 45 calendar days before beginning surveys, the applicant must complete, obtain concurrence from BOEM, BSEE, and USFWS, and adopt an avian and bat monitoring plan, including coordination with interested stakeholders. BOEM, BSEE, and USFWS will review the avian and bat monitoring plan and provide any comments on the plan within 30 calendar days of its submittal. The applicant must resolve all comments on the avian and bat monitoring plan to applicable agency's satisfaction before implementing the plan. The applicant may conclude that BOEM, BSEE, and/or USFWS have concurred in the avian and bat monitoring plan if no comments on the plan are provided within 30 calendar days of submittal:	Bats (G.2.3); Birds (G.2.4)	BOEM BSEE USFWS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Monitoring. All monitoring provisions relative to listed species provided in the BO and the associated ITS must be implemented by the applicant. Where these measures conflict with the Final EIS, measures provided in the BO will supersede those provided in the Final EIS. Specific monitoring components were identified as part of consultation with USFWS and will include: o Annual monitoring reports. The applicant must submit to BOEM (at renewable_reporting@boem.gov), USFWS (at newengland@fws.gov), and BSEE (TIMSWeb with a notification email to protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within 6 months of completion of the last monitoring activity. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. BOEM, BSEE, and USFWS will use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the avian and bat monitoring plan. Following an adaptive management approach, revisions to the avian and bat monitoring plan will be discussed with BOEM, BSEE, and USFWS during review meetings of the annual monitoring plans. o Post-construction quarterly progress reports. The applicant must submit quarterly progress reports during the implementation of the avian and bat monitoring plan to BOEM (at renewable_reporting@boem.gov), USFWS (at newengland@fws.gov), and BSEE (TIMSWeb with a notification email to protectedspecies@bsee.gov) by the 15th day of the month following the end of each quarter during the first full year that the proposed Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered. o Monitoring plan revisions. Within 30 calendar days of submitting the annual monitoring report, the applicant must meet with BOEM, BSEE, and USFWS to discuss the monitoring results; the potential need for revisions to the avian and bat monitoring plan, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If BOEM, BSEE, and/or USFWS determines after this discussion that revisions to the avian and bat monitoring plan are necessary, applicable agencies may require the applicant to modify the avian and bat monitoring plan. If the reported monitoring results deviate substantially from the impact analysis included in the Final EIS, the applicant must transmit to BOEM, BSEE, and USFWS recommendations for new mitigation measures and/or monitoring methods. Additional monitoring and/or mitigation measures will not preclude BOEM and/or USFWS review of monitoring data to determine if reinitiation criteria are met. o Operational reporting (operations). The applicant must submit to BOEM (at renewable_reporting@boem.gov), USFWS (at newengland@fws.gov), and BSEE ((TIMSWeb with a notification email to protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition for all turbines together in tabular format: the proportion of time the turbines were operational each month, the monthly average rotor speed (revolutions per minute) of spinning turbines plus 1 standard deviation, and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. BOEM, BSEE, and USFWS will use this information as inputs for avian collision risk models to assess whether the results deviate substantially from the impact analysis included in the Final EIS. o Raw data. The applicant must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to BOEM, BSEE, and USFWS upon request for the duration of the lease. The applicant must work with BOEM and BSEE to ensure the data are publicly available. The USFWS may specify third-party data repositories that must be used, such as the Motus Wildlife Tracking System or MoveBank, and such parties and associated data standards may change over the duration of the monitoring plan.		
RMPs, Terms and Conditions, Monitoring and Reporting Requirements, and CRs from the USFWS BO Issued September 28, 2023					
RMPs and Terms and Conditions					
97.	Construction, Operations	Collision minimization report	Current technologies and methods will be periodically reviewed for minimizing collision risk of listed and migratory birds with WTGs, including, but not limited to, WTG coloration/marking, lighting, avian deterrents, remote sensing such as radar and thermal cameras, and limited WTG operational changes. • Prior to the start of the first WTG operations for the proposed Project, BOEM must compile, from existing proposed Project documentation (e.g., the biological assessment, other consultation documents, the Final EIS, the COP), a stand-alone summary of technologies and methods that BOEM evaluated to reduce or minimize bird collisions at the proposed Project WTGs. • Within 5 years of the start of the first WTG operation, and then every 5 years for the life of the proposed Project, BOEM must prepare a collision minimization report, reviewing best available scientific and commercial data on technologies and methods that have been implemented, or are being studied, to reduce or minimize bird collisions at offshore and onshore WTGs. The review must be global in scope. • BOEM must distribute a draft collision minimization report to the services, Park City Wind, and appropriate state agencies for a 60-day review period; BOEM must address all comments received during the review period and issue the final report within 60 days of the close of the review period. • Following issuance of the final collision minimization report, the services may call for a meeting. Within 60 days following a call for such a meeting, BOEM must convene a meeting with BSEE, the services, the applicant, and appropriate state agencies to discuss the collision minimization report and whether implementation of any technologies/methods is warranted.	Bats (G.2.3); Birds (G.2.4)	BOEM BSEE USFWS
Monitoring and Reporting Requirements for Incidental Take					
98.	Construction, Operations	Piping Plover and Rufa Red Knot monitoring	BOEM or the applicant will monitor the action area for Piping Plovers (*Charadrius melodus*) and Rufa Red Knots (*Calidris canutus rufa*). As effective technology and methods become available, BOEM should include monitoring for Piping Plovers and Rufa Red Knots that may have collided with a WTG during migration. The monitoring method(s) should be informed by the best available information and technology and could include boat-based monitoring, Motus stations, remote sensing, cameras, microphones, Doppler and Next Generation Weather Radar, environmental DNA, etc. The monitoring should occur during the time(s) of year when collisions are most likely. Initially, monitoring will proceed according to the applicant's Avian and Bat Post-Construction Monitoring Framework and be operational for the first Piping Plover and Rufa Red Knot migratory seasons after the WTGs are operational. Subsequently, consideration of new methods and timing will occur on the same timeline as the collision minimization report described in the Terms and Conditions above unless BOEM and the service agree to a different schedule.	Bats (G.2.3); Birds (G.2.4)	BOEM BSEE USFWS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			BOEM will notify USFWS within 2 business days if an injured or dead Piping Plover or Rufa Red Knot is identified in or within 1 mile of the proposed Project lease area. BOEM or the applicant will provide a report to USFWS annually summarizing: • Monitoring efforts, methods, and results; • Observations of injured or dead Piping Plovers and Rufa Red Knots; • Observations of any listed species perching on the proposed Project infrastructure (including offshore substations); • Implementation and effectiveness of avoidance and minimization measures; and • Any other relevant activity and information related to the proposed action and potential impacts on listed species. BOEM will submit the report to USFWS by the end of each calendar year or at another time agreed to by the two agencies. This report can be part of a larger, more comprehensive offshore wind report submitted to USFWS annually. Reports and notifications will be submitted to: Field Supervisor New England Field Office U.S. Fish and Wildlife Service 70 Commercial Street, Suite 300 Concord, NH 03301 newengland@fws.gov 603-223-2541		
CRs					
99.	Operations	Offshore wind adaptive monitoring and impact minimization framework	To address USFWS concerns related to potential impacts of WTG operation on listed and other species of concern, at both the proposed Project and coastwide scales, USFWS recommends that BOEM develop and adopt an Offshore Wind Adaptive Monitoring and Impact Minimization Framework (Framework) for flying wildlife. Details will follow, but the following are some basic principles for establishment, adoption, and operation of the Framework: 1. Establish a Framework Principals Group to consist of representatives from BOEM, BSEE, USFWS, state natural resource agencies responsible for management of birds, bats, and insect, and offshore wind energy developers/operators. 2. Develop and adopt a written Framework foundational document specifying: a. The governance structure of the Principals Group; b. The geographic coverage of the Framework; c. The species covered by the Framework; and d. The duration of the Framework. 3. Establish an annual operating budget for the Framework to be funded by offshore wind energy developers/operators. 4. Arrange for the Principals Group to meet at least annually and for the Framework foundational document to be updated at least every 5 years. 5. Provide for experts (both internal and external to the Principals Group) to regularly assess new and improved technologies and methods for estimating collision risk of covered species and measuring or detecting collisions. Adopt and deploy such methods deemed most promising by the Principals Group. 6. Coordinate monitoring and research across wind energy projects. Share and pool data and research results coastwide. 7. Provide for experts (both internal and external to the Principals Group) to regularly assess new and improved technologies and methods for minimizing collision risk of covered species. Adopt and deploy such technologies/methods deemed most promising by the Principals Group. 8. Provide for experts (both internal and external to the Principals Group) to periodically assess new and improved technologies and methods for evaluating indirect impacts to covered species from WTG avoidance behaviors (e.g., impacts on time and energy budgets). 9. Periodically assess the level and type of compensatory mitigation necessary to offset any unavoidable direct and indirect impacts of WTG operation on covered species. Adopt and require the levels and types of mitigation deemed appropriate by the Principals Group. 10. Consider partnering with other stakeholders or cross-sector organizations to provide administrative, institutional, and technical support to the Principals Group.	Bats (G.2.3); Birds (G.2.4)	BOEM BSEE USFWS
100.	Operations	Coastwide buildout analysis	While USFWS will complete a thorough assessment of potential direct and indirect impacts for each individual future offshore wind project, USFWS recommends BOEM to analyze potential aggregate impacts from WTG operation at a coastwide scale. A coastwide analysis will work in concert with the Offshore Wind Adaptive Monitoring and Impact Minimization Framework to comprehensively assess, monitor, and manage avian impacts from wind energy development along the U.S. Atlantic coast. A programmatic consultation for wind energy development in the New York Bight is already underway and could set the stage for a full coastwide analysis. Ultimately, a coastwide programmatic opinion may emerge as the most effective and efficient mechanism for assessing, monitoring, minimizing, and offsetting impacts on listed birds from WTG operation on the OCS.	Bats (G.2.3); Birds (G.2.4)	BOEM BSEE USFWS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
101.	Construction, Operations	Compensatory mitigation	To minimize population-level impacts on listed birds, BOEM will require the applicant to provide appropriate compensatory mitigation to offset projected levels of take of listed birds from WTG collision. Compensatory mitigation should be consistent with the conservation needs of listed species as identified in USFWS documents including, but not limited to, listing documents, species status assessments, recovery plans, recovery implementation strategies, and 5-year reviews. Compensatory mitigation should preferentially address priority actions, activities, or tasks identified in a recovery plan, recovery implementation strategies, or 5-year review for Piping Plovers and Rufa Red Knots; however, research, monitoring, outreach, and other recovery efforts that do not offset birds killed via collision mortality are not considered compensatory mitigation. Compensatory mitigation may include, but is not limited to: restoration or management of lands, waters, sediment, vegetation, or prey species to improve habitat quality or quantity for listed birds; efforts to facilitate habitat migration or otherwise adapt to sea level rise; predator management; management of human activities to reduce disturbance to listed birds; and efforts to curtail other sources of direct human-caused bird mortality such as from vehicles, collision with other structures (e.g., power lines, terrestrial wind turbines), hunting, oil spills, and harmful algal blooms. Geographic considerations may include, but are not limited to, any listed species recovery unit(s) or other management unit(s) determined to be disproportionally affected by or vulnerable to collision mortality; and/or those portions of a species' range where compensatory mitigation is most likely to be effective in offsetting collision mortality. Compensatory mitigation for the proposed Project may be combined with mitigation associated with other offshore wind projects, but in no case should compensatory mitigation be double-counted as applying to more than one offshore wind project. BOEM will require the applicant to prepare a compensatory mitigation plan prior to the commissioning of the first WTG. The compensatory mitigation plan should provide compensatory mitigation actions to offset projected levels of take of listed birds at a ratio of at least 1:1 for the full 33-year lease, although it may include actions to offset projected take at a higher ration. The compensatory mitigation plan should include: • Detailed description of one or more specific mitigation actions; • The specific location for each action; • A timeline for completion; • Itemized costs; • A list of necessary permits, approvals, and permissions; • Details of the mitigation mechanism (e.g., mitigation agreement, applicant-proposed mitigation); • Best available science linking the compensatory mitigation action(s) to the projected level of collision mortality as described in the opinion; • A schedule for completion; • Monitoring to ensure the effectiveness of the action(s) in offsetting the target level of take; • Flexibility to adjust mitigation actions based on documented effectiveness of implemented actions and the level of take projected by Band (2012) or Stochastic Collision Risk Assessment for Movement (or its successor), whichever is most appropriate for the proposed Project taking into account model limitations; • Current information regarding any impacts of offshore lighting on the species addressed in the opinion; and • The effectiveness of any minimization measures that have been implemented. Compensatory mitigation plan development and implementation should occur according to the following schedule: • At least 180 calendar days before the commissioning of the first WTG, BOEM should distribute a draft plan to BSEE and USFWS, appropriate state agencies, and other identified stakeholders or interested parties for a 60-calendar-day review period. • At least 90 calendar days before the commissioning of the first WTG, BOEM should transmit a revised compensatory mitigation plan for approval by BSEE and USFWS, along with a record of comments received on the draft plan. BOEM should rectify any outstanding agency comments or concerns before final approval by BOEM, BSEE, and USFWS. • Before or concurrent with the commissioning of the first WTG, BOEM should provide documentation to BSEE and USFWS showing financial, legal, or other binding commitment(s) to compensatory mitigation plan implementation. At least annually, BOEM, BSEE, USFWS, and the applicant should work together to assess the effectiveness of compensatory mitigation for collisions of listed birds with the proposed Project turbines. BOEM should take the lead in coordinating this effort. Appropriate state agencies should be invited to participate in these mitigation assessments. The first mitigation assessment should occur during construction, prior to the start of WTG commissioning. Subsequent mitigation assessments should be held concurrent with or shortly after the annual monitoring data review. Additional mitigation assessments (addressing minimization and/or compensatory mitigation) may be carried out at any time upon request by BOEM, BSEE, USFWS, appropriate state agencies, or the applicant, based on substantive new information or changed circumstances. These periodic mitigation assessments for the proposed Project may eventually be integrated into a regional or coastwide adaptive monitoring and impact minimization framework.		
NMFS EFH CRs issued on October 20, 2023[c]					
EFH CRs					
102.	Construction, Operations, Decommissioning	Recommendations to avoid and minimize adverse impacts on Atlantic cod (*Gadus morhua*) spawning	To minimize adverse impacts on Atlantic cod spawning aggregations within and adjacent to the proposed Project area and to reduce the risk of population-level impacts on this species, pile driving should not occur in the lease area from November 1 and March 31 of each year. To minimize adverse impacts on Atlantic cod spawning, in-water bottom disturbing construction activities, including dredging, cable laying and burying using jetting techniques or mechanical plow should not occur within the lease area or the OECC between Muskeget Channel and the lease area from November 1 through March 31 of each year. HRG sub-bottom profiling (e.g., sparkers, boomers) survey activities should not occur in the lease area between November 1 through March 31 of each year.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			To minimize adverse impacts on Atlantic cod spawning habitats, NMFS recommends the development and implementation of passive acoustic and telemetry surveys within the lease area and the OECC to evaluate cod spawning activity within the proposed Project area. This should be conducted prior to, during, and post-construction to identify the full scope of the area affected by proposed Project construction and operations and assess individual, synergistic, and cumulative impacts of the proposed Project on cod spawning activity. Specifically, perform the following: a. Provide continuous monitoring of Atlantic cod spawning aggregations within, and immediately adjacent to, the lease area and the OECC between November 1 and March 31 prior to the construction of the proposed Project, during construction, and post-construction; b. Place additional passive acoustic receivers within the lease area and OECC to increase coverage; c. Add an additional glider to the ongoing survey to increase the spatial coverage and extend coverage within the proposed Project area and adjacent areas. The ongoing survey should focus on adding survey coverage (i.e., increase the number of glider tracts) within the proposed Project area to provide detection of cod spawning activity within the proposed Project area before, during, and after construction; d. The survey coverage should extend outside the lease area within areas where proposed Project impacts occur (e.g., wind wake impacts) to assess individual, synergistic and cumulative impacts of construction and operations on the distribution of cod spawning activity; and e. Data and results from this study should be made available to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov. To minimize impacts on benthic habitats and the proposed HAPC for Atlantic cod spawning, proposed areas including the WTGs, ESPs, inter-array cables, and the OECC identified as cod spawning locations based on pre-construction passive acoustic and telemetry surveys should be removed or relocated to avoid these areas.		
103.	Construction, Operations, Decommissioning	Recommendations to avoid and minimize impacts on longfin squid (*Doryteuthis pealeii*) and their designated EFH	To minimize adverse impacts on adult spawning and demersal early life stages of the longfin squid within Nantucket Shoals and the OECC, sediment-generating activities should be sequenced such that activities along the OECC in waters 50 meters in depth or less are avoided between May 1 and July 31 of any year.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE
104.	Construction, Operations, Decommissioning	Recommendations to minimize impacts on benthic habitats	1. To minimize adverse impacts on complex habitats within Muskeget Channel, including juvenile cod HAPC, the Western Muskeget Variant cable corridor should not be authorized and all cables should be consolidated within the Eastern Muskeget Channel corridor (i.e., Alternative C-1, Scenario 1). 2. WTGs, ESPs, and cables (inter-array and export) should be sited to avoid sensitive benthic habitats, including rocky habitats, SAV, and non-reef building hard corals. Soft bottom areas (identified by low multibeam backscatter returns) absent benthic features should be targeted for siting. 3. Develop and implement a WTG, ESP, and cable siting plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. The plan should primarily use multibeam backscatter data, bathymetry, and boulder data layers to inform siting and/or micrositing. The plan should demonstrate/describe how impacts on sensitive benthic habitats were avoided and minimized. If avoidance and minimization was not feasible, the plans should describe in detail the rationale for this infeasibility. Additionally, the plan and maps depicting sensitive benthic habitats should be provided to vessel operators so that avoidance and minimization measures can be taken in real time. For areas where sensitive benthic habitats cannot be fully avoided through micrositing, the siting plan should avoid and minimize areas in the following order of preference: a. Complex habitats (i.e., areas of medium to high backscatter) with high density large boulders; b. Complex habitats (i.e., areas of medium to high backscatter) with medium density large boulders; c. Complex habitats (i.e., areas of medium to high backscatter) with low density large boulders; d. Complex habitats (i.e., areas of medium to high backscatter) with scattered large boulders; and e. Complex habitats (i.e., areas of medium to high backscatter) with no large boulders (≥0.5-meter diameter). A copy of the final plan should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. Following the completion of construction, HESD should be provided with post-construction information including how the plan was implemented. 4. To the extent practicable, if cables must cross complex habitat or benthic features (i.e., sand waves), they should be located at the narrowest points to cross perpendicularly to reduce the extent of sand wave leveling/dredging required; dredged material should not be disposed of within sensitive benthic habitats. 5. To minimize impacts on sensitive benthic habitats from boulder/cobble removal/relocation activities, boulders and cobbles should be: a. Relocated as close to the impact area as practicable, in areas immediately adjacent to existing similar complex bottom; b. Placed in a manner that does not hinder navigation or impede commercial fishing; and c. Avoid impacts on existing complex habitats. 6. In order to minimize impacts on sensitive benthic habitats from boulder/cobble removal/relocation activities, boulders that will be relocated using boulder "pick" methods should be relocated outside the area necessary to clear and placed along the edge of existing complex habitats such that the placement of the relocated boulders will result in a marginal expansion of complex habitats into soft-bottom habitats (identified by low multibeam backscatter returns). 7. Develop and implement a boulder relocation plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. NMFS recommends that the plan use multibeam backscatter data and boulder layers (data) to inform micrositing. The plan should demonstrate/describe how impacts on sensitive benthic habitats and other elements (e.g., UXOs) were avoided and minimized. If avoidance and minimization was not feasible, the plans should describe in detail the rationale for this infeasibility. Additionally, all plans and maps depicting locations/extents of sensitive benthic habitats should be provided to vessel operators so that avoidance and minimization measures	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			can be taken in real time. A copy of the final plan should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. Following the completion of construction, HESD should also be provided with information on how the plan was implemented and locations of relocated boulders (as-built maps/figures). 8. To minimize impacts of benthic habitat modification, in all proposed Project areas where seafloor preparation activities include the use of plows, jets, grapnel runs, or similar methods, post-construction acoustic surveys (e.g., multibeam backscatter and side scan sonar) capable of detecting bathymetry changes of 0.5 meters or less should be completed to demonstrate how the bottom was modified by preparation and construction activities. Post-construction acoustic survey data should be provided to NOAA Fisheries HESD in a viewable format at NMFS.GAR.HESDoffshorewind@noaa.gov. 9. Avoid anchoring or placing jack-up barge spud cans or footings on/in sensitive benthic habitats, including any area where complex habitats or medium to high multibeam backscatter returns occur. 10. If anchoring is necessary in sensitive benthic habitats, anchor lines should be extended to the extent practicable to minimize the number of times the anchors must be raised and lowered to reduce the amount of habitat disturbance. 11. If anchoring must occur in any sensitive benthic habitats and vessels must remain stationary, dynamic positioning systems or mid-line buoys on anchor chains should be required to minimize impacts on those habitats. 12. Develop and implement an anchoring and jack-up barge plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. NMFS recommends that the plan use multibeam backscatter data, bathymetry and boulder layers (data) to inform micrositing. If avoidance and minimization was not feasible, the plans should describe in detail the rationale for this infeasibility. Additionally, the plan and maps depicting locations/extents of sensitive benthic habitats should be provided to vessel operators so that avoidance and minimization measures can be taken in real time. A copy of the final plan should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. 13. To minimize permanent adverse impacts on existing benthic habitats from the placement of scour protection, all cables should be microsited to allow for full penetration/burial, regardless of habitat type (by siting cables in appropriate substrates). Additional bottom surveys should be conducted, as necessary, to inform the siting of the cables. 14. To minimize the impacts of habitat conversion from scour protection, natural or engineered rounded stone of consistent grain size that mimics natural seafloor substrates should be used. At a minimum, any exposed surface layer should be designed and selected to provide three-dimensional structural complexity that creates a diversity of crevice sizes (e.g., mixed stone sizes) and rounded edges (e.g., tumbled stone) and be sloped such that outer edges match the natural grade of the seafloor. Should the use of concrete mattresses be necessary, bioactive concrete (i.e., with bio-enhancing admixtures) should be used as the primary scour protection (e.g., concrete mattresses) or veneer to support biotic growth. 15. Develop and implement a scour protection plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. NMFS recommends that the plan use multibeam backscatter data, bathymetry and boulder layers (data) to inform this plan. The plan should demonstrate/describe how impacts on sensitive benthic habitats (areas of medium to high backscatter return) were avoided and minimized in the selection and placement of scour protection. If avoidance and minimization was not feasible, the plans should describe in detail the rationale for this infeasibility. Additionally, the plan and maps depicting sensitive benthic habitats should be provided to vessel operators so that avoidance and minimization measures from scour protection placement can be taken in real time. A copy of the final plan should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. HESD should also be provided with post-construction information on: a. How the plan was implemented; b. The locations and type of scour protection depicted in as-built surveys/plans, maps, and figures; and c. Specific descriptions of how the types of scour protection were selected to mimic existing seafloor conditions. 16. Any debris encountered during a site preparation grapnel run should be retained and discarded at an appropriate upland facility. Debris should not be abandoned in place or be returned overboard. 17. Avoid direct and indirect impacts on SAV beds in Centerville Harbor and nearshore areas in the proposed landfall sites at Craigville Beach, Dowses Beach, and alternative sites; Covell's Beach and Wianno Avenue from cable installation; vessel anchoring; barge spud cans; and HDD exit pits through the following: a. Avoidance of SAV habitat should be based on surveys conducted no more than 1 year prior to the start of construction and use approved methods (i.e., Joint Federal Agency Submerged Aquatic Vegetation Survey Guidance for the New England Region 2016); b. Maps derived from SAV surveys should be provided to vessels/captains to ensure SAV is avoided; and c. A minimum of 100 feet (30 meters) between SAV and any construction activities (e.g., anchoring, equipment staging) should be maintained at all times. 18. In all inshore/shallow marine habitats where seafloor preparation and cable installation activities will occur, impacts on sensitive benthic habitats should be avoided and minimized through the use of HDD, micrositing, and rerouting. All disturbed areas should be restored to pre-construction conditions, inclusive of bathymetry, contours, and sediment types. Pre-construction surveys to determine conditions and post-construction surveys should be conducted to verify restoration has occurred. Survey results should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov. 19. To minimize impacts from vessel operation in estuarine/nearshore habitats, all vessels should float at all stages of the tide (i.e., avoid vessel grounding); all vessels should be required to follow other EFH CRs associated with anchoring/avoidance. 20. Trenching in open nearshore marine waters and the intertidal zone should be avoided.		

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			21. Dredged materials from HDD exit pits should be stored on a barge or on uplands and used to backfill the excavated areas or removed to a suitable upland disposal site if the material contains elevated levels of contaminants. HDD exit pits should be restored to pre-construction conditions with native and/or clean, compatible material once construction and installation is complete. 22. Frac-out plans should be developed for all areas where HDD is proposed to be used. NMFS recommends these plans be developed with particular attention to protecting SAV, which has been documented around Spindle Rock adjacent to the proposed Phase 1 landfall site at Craigville Public Beach and west of the proposed Phase 2 landfall site at Dowses Beach. A copy of the final plan should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. 23. Mitigation should be required for any impacts on designated HAPCs. Should the proposed Project unintentionally affect SAV through frac-out, anchoring in the SAV bed, cable installation, dredging, or other direct or indirect impacts from construction of the proposed Project, compensatory mitigation should be provided for all areas of SAV affected by construction activities, including cable installation and dredging. In addition, compensatory mitigation should be provided for impacts on juvenile Atlantic cod HAPC for the entire area of impact within the cable corridor routed through Muskeget Channel. A compensatory mitigation plan that satisfies each element of a complete compensatory mitigation plan as identified in 33 CFR Parts 325 and 332, Compensatory Mitigation for Losses of Aquatic Resources, and NOAA's Mitigation Policy for Trust Resources should be required for any impacts on SAV and juvenile Atlantic cod HAPC. Mitigation plans should be provided to NOAA Fisheries HESD at NMFS.GAR.HESDoffshorewind@noaa.gov for review and comment prior to construction.		
105.	Construction	Recommendations to minimize acoustic impacts	1. The use of noise mitigating measures should be required for any pile driving in the nearshore (e.g., HDD exit pit sediment containment) and offshore proposed Project areas (e.g., WTG and ESP installation), including the use of soft-start procedures and the deployment of noise-dampening equipment such as bubble curtains or double-bubble curtains. 2. A plan outlining the noise mitigation procedures for offshore activities should be filed with BOEM and USACE for approval before construction commences. The noise mitigation plan should include: a. Passive acoustic sound verification monitoring during pile driving activities; additional noise dampening technology should be applied if real-time monitoring indicate noise levels exceed the modeled 10 dB attenuation levels; b. A process for notifying NOAA Fisheries HESD within 24 hours if any evidence of a fish kill during construction activity is observed, as well as contingency plans to resolve issues; and c. Plans for acoustic monitoring of construction activities. BOEM should provide HESD with a copy of the final plan before in-water work begins, as well as acoustic monitoring reports associated with any/all noise-related monitoring. Plans and information should be submitted to HESD at NMFS.GAR.HESDoffshorewind@noaa.gov.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE
106.	Construction, Operations	Recommendations to address uncertainties and minimize impacts from proposed Project operations	1. The Benthic Habitat Monitoring Plan, dated December 2022, should be updated with the following: a. Include pre-construction/baseline monitoring for a minimum of 3 years prior to any construction activities and continue annually for a minimum of 5 years post-construction. b. Include invasive species (e.g., Didemnum vexillum) monitoring as a discrete component of the monitoring plan to track the fragmentation and spread of invasive species across the lease as a result of construction activities. c. Revise the targeted window for monitoring surveys to target the time of year with peak biomass, typically late summer/early fall, and prioritize surveying at the same time of year every year. d. Add "relocated boulder" as a third impact source stratification (similar to scour protection or offshore export cable) and update the power analysis accordingly for sampling locations needed across the OECC and SWDA to sufficiently sample across all three impact sources and identified habitat zones. e. Expand the proposed collection of post-construction acoustic data (multibeam bathymetry and backscatter and side scan sonar) to be proposed Project-wide to measure the total area subject to physical change as a result of proposed Project development. Post-construction acoustic surveys should be able to answer the following: i. How much soft-bottom habitat across the lease has been converted to hard bottom? ii. How much hardbottom habitat across the proposed Project has been converted to soft-bottom? iii. How much natural hard-bottom habitat across the proposed Project area has been converted into human-made hard-bottom? iv. How much total human-made hard bottom has been introduced into the proposed Project area? v. How many hard bottom habitats have been impacted (i.e., relocated, fragmented, reduced in complexity, etc.) by the proposed Project compared with pre-construction surveys? vi. Have sand wave habitats dredged and leveled during cable installation been restored or naturally recovered? 2. Develop an in situ specific monitoring program to address impacts of operations of the proposed Project on EFH and federally managed species. This monitoring recommendation is consistent with principles outlined in NOAA's Mitigation Policy for Trust Resources, which highlights the use of the best available scientific information, such as results of surveys and other data collection efforts when existing information is not sufficient for the evaluation of proposed actions and mitigation, or when additional information will facilitate more effective or efficient mitigation recommendations. Incorporation of this monitoring recommendation will further align the monitoring efforts of the proposed Project with the NOAA Fisheries and BOEM Federal Survey Mitigation Strategy, which has evaluation and integration of wind energy monitoring studies with NOAA Fisheries surveys as a primary goal. The proposed Project-specific monitoring program should measure in situ the stressors created by operations on the ecosystem from operational noise, EMF, wind wake impacts, and the presence of structures. Studies should also evaluate the biological impacts of those stressors on commercially important species in the proposed Project area such as longfin squid, Atlantic cod, American lobster, Atlantic sea scallops, black sea bass, golden tilefish, Jonah crab, monkfish, silver hake, scup, skates, and summer flounder. Monitoring plans should include the collection of a minimum of 3 years of baseline data during construction	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE

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			and a minimum of 5 years of post-construction data collection. Plans should be incorporated into a comprehensive monitoring strategy and be provided to NOAA Fisheries GARFO and NEFSC for review and comment within 90 days of Record of Decision issuance. A response to NOAA Fisheries comments should be provided. All data and metadata resulting from research and monitoring studies should be provided to NOAA Fisheries. These monitoring studies should be developed in partnership with NOAA Fisheries and other scientific institutions to aid in addressing the following questions: a. How far do impacts on sound pressure, particle motion, and substrate vibration extend from the individual WTGs and the proposed Project collectively? i. What impact do these operational noise impacts have on the distribution of larvae for species with designated EFH in the proposed Project area and prey for these species (e.g., sand lance)? ii. What is the auditory environment pre- and post-construction and how does auditory exposure change within the lease area relative to distance from sound sources (WTGs)? How does exposure change with increasing distance from the lease area? b. What is the spatial distribution of the EMF emissions around inter-array and export cables? The proposed EMF study for the export cables should be expanded to measures EMF emissions from the inter-array cables and the export cables and address the following: i. What is the behavioral response to the altered EMF of fisheries resource species/life stages with known EMF-sensitivity? ii. Do EMF emissions affect the rate of settlement of juvenile fish species within designated juvenile cod HAPC in Muskeget Channel? iii. Do EMF emissions affect the habitat use or demersal egg distribution by longfin squid along the OECC? c. How far does the marine and atmospheric wind wake extend from the proposed Project during operations? i. What are the impacts on physical water column properties, primary and secondary production, and larval dispersal for species with designated EFH in the proposed Project area? ii. What is the distribution, abundance, survival, growth rate, and recruitment rate of larvae along a distance gradient from offshore wind structures? This should include an ichthyoplankton study that evaluates the impact of altered local hydrodynamic patterns around turbine foundations and the broad scale impacts of wind wakes on hydrodynamic patterns and larvae that extend beyond the footprint of the proposed Project. d. How does the presence of structures, scour protection, and introduction of engineered stone/riprap affect the natural mortality of species with EFH within the OECC and SWDA? i. Does the introduction of fragmented engineered stone/riprap across the SWDA increase the natural mortality of species with sensitive life stages, such as juvenile Atlantic cod, through increased predation exposure or other mechanisms? ii. Are juvenile settlement and/or survivorship rates affected as a result of construction, and the introduction of scour protection and cable armoring, within natural complex habitat along the OECC?		
107.	Construction, Operations, Decommissioning	Recommendations to minimize impacts from contaminants	1. The implementation of preventive measures should be required to reduce the risk of contaminant emissions or accidental release of chemicals. Such measures may include backup systems, secondary containments, closed loop systems, and/or recovery tanks. 2. Any anti-corrosion protection methods or systems proposed should be identified. If sacrificial anodes are used, Al anodes should be selected over Zn anodes. Any application of anti-corrosion coatings should be allowed to cure fully on land, and best management practices for reducing spills should be implemented if reapplied offshore.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE
108.	Construction, Operations, Decommissioning	Recommendations for reinitiation of consultations	i. The EFH consultation should be reinitiated prior to the permitting of any additional cable routes, such as the South Coast Variant, or the Covell's Beach (Phase 1) and Wianno Avenue (Phase 2) landfall sites, that were not contemplated in the EFH assessment but that are identified in the EIS. ii. The EFH consultation should be reinitiated prior to permitting if, based on surveys conducted no greater than 1 year prior to the start of construction, SAV beds are identified within 100 feet (30 meters) of any in-water construction activities, including cable installation, dredging, HDD exit pits, or vessel anchoring. iii. For Phase 2 of the proposed Project, the EFH consultation should be reinitiated if suction buckets are used to secure feet of the bottom frame foundations of WTGs or ESPs. Suction buckets are listed as an option for WTG and/or ESP installation, but the EFH assessment does not provide any information or evaluation of potential impacts on EFH or federally managed species. iv. The EFH consultation should be reinitiated prior to decommissioning turbines to ensure that the impact on EFH as a result of the decommissioning activities have been fully evaluated and minimized to the extent practicable. Pre-consultation coordination related to decommissioning should occur at least 5 years prior to proposed decommissioning.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE
Fish and Wildlife Coordination Act Recommendations – USACE jurisdiction					
109.	Construction, Operations, Decommissioning	NOAA Fisheries scientific surveys	The proposed Project should be required to mitigate the major impacts on NOAA Fisheries scientific surveys consistent with NOAA Fisheries-BOEM Federal Survey Mitigation Strategy – Northeast U.S. Region. The proposed Project's plans to mitigate these impacts at the project and regional levels should be provided to NOAA Fisheries for review and approval prior to BOEM's decision on its acceptance. Mitigation is necessary to ensure that NOAA Fisheries can continue to accurately, precisely, and timely execute our responsibilities to monitor the status and health of trust resources.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE

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110.	Construction, Operations,	Locations of boulders, berms, and protection measures	Locations of relocated boulders, created berms, and scour protection, including cable protection measures (e.g., concrete mattresses) should be provided to NOAA Fisheries, all other federal agencies with maritime jurisdiction, and the public as soon as possible to help inform all interested parties of potential gear obstructions.	Finfish, Invertebrates, Essential Fish Habitat (3.6); Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS USACE
RMPs, Terms and Conditions, and CRs from the NMFS BO Issued February 16, 2024					
RMPs					
111.	Construction	Minimize pile driving impacts	Effects to ESA listed species must be minimized and monitored during WTG and ESP foundation installation.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR)
112.	Construction	Minimize unexploded ordinances/ munitions of explosive concern (UXO/MEC) detonation impacts	Effects to ESA listed species must be minimized and monitored during UXO/MEC detonations.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
113.	Construction, Operations, Decommissioning	Minimize vessel Impacts	Effects to ESA listed sturgeon resulting from project vessel operations in the Delaware Bay and Delaware River must be monitored and reported.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
114.	Construction, Operations, Decommissioning	Reporting requirements	Effects to, or interactions with, ESA listed Atlantic sturgeon, whales, and sea turtles must be properly documented during all phases of the proposed action, and all incidental take must be reported to NMFS GARFO.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
115.	Construction, Operations, Decommissioning	Monitoring plans	Plans must be prepared that describe the implementation of activities or monitoring protocols for which the details were not available at the time this consultation was completed. All required plans must be submitted to NMFS GARFO in advance of the applicable activity with sufficient time for review, comment, and any required concurrence.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
116.	Construction, Operations, Decommissioning	Agency authority	BOEM, BSEE, NMFS OPR, and USACE must exercise their authorities to assess and ensure compliance with the implementation of measures to avoid, minimize, monitor, and report incidental take of ESA listed species during activities described in this Opinion. On-site observation and inspection must be allowed to gather information on the implementation of measures, and the effectiveness of those measures, to minimize and monitor incidental take during activities described in this Opinion, including its ITS.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
Terms and Conditions					
117.	Construction, Operations, Decommissioning	RPM 1 & 2	To implement the requirements of RPM 1 and 2, for ESA listed whales, Park City must comply with the measures specified in the proposed MMPA ITA (which are into the proposed action) as modified or supplemented in the final MMPA ITA, to minimize effects of foundation installation, UXO detonations, and other activities on ESA listed whales. To facilitate implementation of this requirement: A. BOEM must require, through an enforceable condition of their approval of Park City's COP for the New England Wind Project, Park City to comply with any measures for ESA-listed species included in the proposed ITA, which already have been incorporated into the proposed action, as modified or supplemented by the final MMPA ITA. B. NMFS OPR must ensure compliance with all mitigation measures as prescribed in the final ITA. NMFS expects this will be carried out through NMFS OPR's review of plans and monitoring reports, including interim and final SFV reports, submitted by Park City over the life of the MMPA ITA and taking any responsive action within its statutory and regulatory authority it deems necessary to ensure compliance with all final ITA mitigation measures based on the foregoing review. C. USACE must require, through an enforceable conditions of their individual permit authorizations, that Park City comply with any measures in the proposed MMPA ITA regarding ESA-listed marine mammals, which have already been incorporated into the proposed action, and as modified or supplemented by the final MMPA ITA. b. NMFS OPR must ensure compliance with all mitigation measures as prescribed in the final ITA. NMFS expects this will be carried out through NMFS OPR's review of	ESA-listed whales (3.7)	BOEM BSEE NMFS (OPR) USACE

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			plans and monitoring reports, including interim and final SFV reports, submitted by the applicant over the life of the MMPA ITA and taking any responsive action within its statutory and regulatory authority it deems necessary to ensure compliance with all final ITA mitigation measures based on the foregoing review. D. USACE must review the final MMPA ITA as issued by NMFS OPR and determine if an amendment or revision is necessary to the permit issued to The applicant by USACE to incorporate any new or revised measures for pile driving or related activities addressed in the USACE permit, to ensure compliance with any measures in the final MMPA ITA that are revised from, or in addition to, measures included in the proposed ITA, which have been incorporated into the proposed action; and, if necessary, exercise its regulatory authority to make appropriate amendments or revisions.		
118.	Construction	RPM 1	To implement the requirements of RPM 1, the following measures related to SFV for pile driving (inclusive of drilling) carried out for WTG and ESP foundation installation must be required by BOEM, BSEE, USACE, and implemented by Park City. The purpose of SFV and the steps outlined here are to ensure that Park City does not exceed the distances to the auditory injury (i.e., harm) or behavioral harassment threshold (Level A and Level B harassment respectively) for ESA listed marine mammals, the harm or behavioral harassment thresholds for sea turtles, or the harm or behavioral disturbance thresholds for Atlantic sturgeon as analyzed in the Opinion. These thresholds and the distances to them, identified and described in this Opinion, underpin the effects analysis, exposure analysis, and our determination of the amount and extent of incidental take anticipated and exempted in this ITS, including any determination that no incidental take is anticipated (i.e., for Atlantic sturgeon). The measures outlined here are based on the expectation that the initial pile driving methodology and sound attenuation measures (inclusive of impact pile driving, vibratory pile setting, and relief drilling) will result in noise levels that do not exceed the identified distances (as modeled assuming 10 dB attenuation; see Tables 7.1.10-7.1.13, 7.1.26, 7.1.27, 7.1.36) but, if that is not the case, provide a step-wise approach for modifying operations and/or modifying or adding sound attenuation measures that can reasonably be expected to avoid exceeding those thresholds for the next pile being driven. In all instances, any reference to jacket foundation also covers pile driven bottom frame foundations should that alternative foundation type be installed in Phase 2. These requirements are only in place for pile driven foundations (i.e., they do not apply to suction bucket foundations). A. BOEM, BSEE, and USACE must require, and Park City must develop a Sound Field Verification Plan, addressing Thorough and Abbreviated SFV, consistent with the requirements in Terms and Conditions 13.d below. Thorough SFV consists of: SFV measurements 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 meters and three additional ranges selected such that measurement of identified isopleths are accurate, feasible, and avoid extrapolation. At least one additional measurement at an azimuth 90 degrees from the array at approximately 750 meters must be made. At each measurement location, there must be a near-bottom and mid-water column hydrophone (measurement systems); the recordings must be continuous throughout the duration of all pile driving (inclusive of any relief drilling) of each foundation. Abbreviated SFV consists of: SFV measurements made at a single acoustic recorder, consisting of a near-bottom and mid-water hydrophone, at approximately 750 meters from the pile, in the direction of lowest transmission loss, to record sounds throughout the duration of all pile driving (inclusive of relief drilling) of each foundation. B. BOEM, BSEE, and USACE must require, and Park City must implement Thorough SFV, as detailed in 2c below, for at least the following foundations: i. First construction year: the first 3 monopiles installed with only an impact hammer; the first 3 monopiles installed with a vibratory hammer followed by an impact hammer; the first 2 jacket foundations (all piles) installed; the first foundation (regardless of type) where relief drilling is used; the first monopile and first jacket foundation (all piles) installed in December (winter sound speed profile); and, the first foundation for any foundation scenarios that were modeled for the exposure analysis (e.g., rated hammer energy, number of strikes, representative location) that does not fall into one of the previously listed categories (e.g., if the first two jacket foundation are installed with an impact hammer only, Thorough SFV would be required for the first jacket foundation installed with vibratory and impact pile driving). ii. Any subsequent construction year: a. if there are no changes to the pile driving equipment (i.e., same hammer, same NAS) – the first monopile and first jacket foundation (all piles); b. if a revised facility design report / fabrication and installation report or other information is submitted to BOEM and BSEE that details changes to the equipment (e.g., different hammer, different NAS) – thorough SFV requirements for the first construction year apply. c. any foundation type or technique included in the requirements for the first construction year that was not installed until a subsequent construction year (e.g., if drilling is not used until year 2 or 3, the first foundation where relief drilling is used must have thorough SFV). C. During Thorough SFV, installation of the next foundation (of the same type/foundation method) may not proceed until Park City has reviewed the initial results from the Thorough SFV and determined that there were no exceedances of any distances to the identified thresholds based on modeling assuming 10 dB attenuation. D. If any of the Thorough SFV measurements from any pile indicate that the distance to any isopleth of concern for any species is greater than those modeled assuming 10 dB attenuation, Park City must notify BOEM, BSEE, USACE, NMFS OPR, and NMFS GARFO within 24 hours of reviewing the Thorough SFV measurements and must implement the following measures for the next pile of the same type/installation methodology, as applicable. These requirements are in place for monopiles and jacket foundations and repeat until the criteria in 2.d.ii.a or 2.d.ii.b are met. i. Clearance and Shutdown Zones. If any of the Thorough SFV measurements indicate that the distances to level A thresholds for ESA listed whales (peak or cumulative) or permanent threshold shift peak or cumulative thresholds for sea turtles are greater than the modeled distances (assuming 10 dB attenuation, see Tables 7.1.10-7.1.13, 7.1.26, 7.1.27, 7.1.36), the clearance and shutdown zones (see Table 11.1) for subsequent piles of the same type (e.g., if triggered by SFV results for a monopile, for the next monopile) must be increased so that they are at least the size of the distances to those thresholds as indicated by SFV. For every 1,500 meters that a marine mammal clearance or shutdown zone is expanded, additional PSOs must be deployed from additional platforms/vessels to ensure adequate and complete monitoring of the expanded shutdown and/or clearance zone; Park City must deploy any additional PSOs consistent with the approved Pile Driving Monitoring Plan in consideration of the size of the new zones and the species that must be monitored (i.e., sea turtles and/or whales). Use of the expanded clearance and shutdown zones must continue for additional piles until Park City requests and receives concurrence from NMFS GARFO to revert to the original clearance and shutdown zones. ii. Attenuation Measures. Park City must identify one or more additional, modified, and/or alternative noise attenuation measure(s) and/or operational change(s) included in the approved SFV plan (see Terms and Conditions 13d) that is expected to reduce sound levels to the modeled distances and must implement that measure for the next pile of the same type and pile driving method that is installed (e.g., if triggered by SFV results for a monopile installed with vibratory pile driving followed by impact pile	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE

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			driving, for the next monopile with vibratory pile driving followed by impact pile driving). Attenuation measures that could reduce sound levels to the modeled distances include but are not limited to adding a noise attenuation device, adjusting hammer operations, and adjusting or otherwise modifying the noise mitigation system. Park City must provide written notification to BOEM, BSEE, USACE, NMFS OPR, and NMFS GARFO of the changes implemented within 24 hours of their implementation. a. If no additional, modified, and/or alternative measures or operational changes are identified for implementation, or if Thorough SFV of the third pile (of the same type and installation method; i.e., the pile installed with a second round of additional/modified noise attenuation or pile driving operations) indicates that the distance to any isopleths of concerns for any ESA listed species are still greater than those modeled assuming 10 dB attenuation, installation of that foundation type/installation methodology must be paused until there is concurrence from NMFS, BOEM, and BSEE to proceed. NMFS GARFO, NMFS OPR, BOEM, BSEE, and USACE will meet within three business days to discuss: the results of the Thorough SFV monitoring, the severity of exceedance of distances to identified isopleths of concern, the species affected, modeling assumptions, and whether any triggers for reinitiation of consultation are met (50 CFR 402.16), including consideration of whether the Thorough SFV results constitute new information revealing effects of the action that may affect listed species in a manner or to an extent not previously considered in the consultation. Implementation of additional measures to reduce noise and additional Thorough SFV may also be required as a result of this meeting. b. Following installation of a pile with additional, alternative, or modified noise attenuation measures/operational changes required by 2.d if Thorough SFV results indicate that all isopleths of concern are within distances to isopleths of concern modeled assuming 10 dB attenuation, Thorough SFV must be conducted on two additional piles of the same type/installation method (for a total of at least three piles with consistent noise attenuation measures). If the Thorough SFV results from all three of those piles are within the distances to isopleths of concern modeled assuming 10 dB attenuation, then BOEM, BSEE, and USACE must require, and Park City must continue to implement the approved additional, alternative, or modified sound attenuation measures/operational changes. Park City can request concurrence from NMFS GARFO and NMFS OPR to return to the original clearance and shutdown zones (Table 11.1). E. BOEM, BSEE, and USACE must require, and Park City must implement Abbreviated SFV for all piles for which the Thorough SFV monitoring outlined above is not carried out. Abbreviated SFV consists of: SFV measurements made at a single acoustic recorder, consisting of a near-bottom and mid-water hydrophone, at approximately 750 meters from the pile, in the direction of lowest transmission loss, to record sounds throughout the duration of all pile driving (inclusive of relief drilling) of each foundation. The Abbreviated SFV data collected will be used to compare to the thresholds defined as a result of Thorough SFV to assess whether the representative levels at approximately 750 meters were exceeded. i. Park City must review Abbreviated SFV results for each pile within 24 hours of completion of the foundation installation (inclusive of pile driving and any drilling), and, assuming measured levels at 750 meters did not exceed the thresholds defined during Thorough SFV, does not need to take any additional action. Results of Abbreviated SFV must be submitted with the weekly pile driving report. ii. If measured levels from Abbreviated SFV for any pile are greater than expected levels, Park City must evaluate the available information from the pile installation to determine if there is an identifiable cause of the exceedance (i.e., a failure of the NAS), identify and implement corrective action, and report this information to BOEM, BSEE, USACE, and NMFS GARFO within 48 hours of completion of the installation of the pile (inclusive of all pile driving and drilling), during which the exceedance occurred. If Park City can demonstrate that the exceedance was the result of a failure of the NAS (e.g., loss of a generator supporting a bubble curtain such that one bubble curtain failed during pile driving) that can be remedied in a way that returns the NAS to pre-failure conditions, Park City can request concurrence from BOEM, BSEE, NMFS OPR, and NMFS GARFO to proceed without thorough SFV monitoring that would otherwise be required within 72 hours. Park City is required to remedy any such failure of the NAS prior to carrying out any additional pile driving. iii. If results of Abbreviated SFV monitoring for any pile exceed expected values at 750 meters, Park City must resume Thorough SFV monitoring (as described in 2a above) for installation of the same foundation type and installation method within 72 hours after the completion of the pile driving with an exceedance. a. Park City can request concurrence from BOEM, BSEE, NMFS OPR, and NMFS GARFO to resume Abbreviated SFV monitoring following submission of an interim report from Thorough SFV that demonstrates ranges to the identified thresholds within expected values. Park City may automatically resume Abbreviated SFV monitoring if three consecutive Thorough SFV reports indicate ranges to regulatory thresholds within predicted values. Interim Thorough SFV monitoring reports must be submitted to BOEM, BSEE, USACE, NMFS OPR, and NMFS GARFO within 48 hours of completion of the monitored pile. b. If results from any Thorough SFV monitoring triggered by results from Abbreviated SFV indicate that ranges to the identified thresholds are larger than expected values, the requirements for Thorough SFV outlined in 2.a above apply (i.e., continuing Thorough SFV and implementing requirements for additional/modified attenuation measures). Additionally, BOEM, BSEE, USACE, NMFS OPR, and NMFS GARFO will meet within three business days to discuss: the results of SFV monitoring, the severity of exceedance of distances to identified isopleths of concern, the species affected, modeling assumptions, and whether any triggers for reinitiation of consultation are met (50 CFR 402.16), including consideration of whether the SFV results constitute new information revealing effects of the action that may affect listed species in a manner or to an extent not previously considered in the consultation. Additional measures and Thorough SFV may also be required as a result of this meeting.		
119.	Construction	RPM 2	To implement the requirements of RPM 2, the following measures must be required by BOEM, BSEE, and/or USACE and implemented by Park City: A. Establish a clearance zone for sea turtles extending 500 meters around any planned UXO/MEC detonations. Maintain the clearance zone for at least 60 minutes prior to any UXO/MEC detonation. This requirement clarifies the size of the clearance zone for sea turtles. Park City must ensure that there is sufficient PSO coverage to reliably document sea turtle presence within the clearance zone as described in the Marine Mammal and Sea Turtle Monitoring Plan (see Terms and Conditions 13a). In the event that a PSO detects a sea turtle inside the 500 meters clearance zone, detonation will be delayed until the sea turtle has not been observed for 30 minutes or has been observed to have left the clearance zone. B. Provide BOEM, BSEE, and NMFS GARFO with notification of planned UXO/MEC detonation as soon as possible but at least 48 hours prior to the planned detonation, unless this 48-hour notification would create delays to the detonation that would result in imminent risk of human life or safety. This notification must include the coordinates of the planned detonation, the estimated	Sea Turtles (3.8)	BOEM BSEE NMFS (OPR) USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
120.	Construction	RPM 2	To implement the requirements of RPM 2, the following measures related to SFV for UXO/MEC detonation must be required by BOEM, BSEE, USACE, and implemented by Park City. The purpose of SFV and the steps outlined here are to ensure that Park City does not exceed the distances to the injury (i.e., harm) or harassment thresholds for ESA listed marine mammals, the permanent threshold shift or temporary threshold shift thresholds for sea turtles, or the onset of injury thresholds for Atlantic sturgeon that are identified in this Opinion and that underpin the effects analysis, exposure analysis and our determination of the amount and extent of incidental take exempted in this ITS, including the determination that no incidental take is anticipated in some cases. The measures outlined here are based on the expectation that Park City's initial UXO/MEC detonation methodology and sound attenuation measures will result in noise levels that do not exceed the identified distances to thresholds (as modeled assuming 10 dB attenuation) but, if that is not the case, provide a step-wise approach for modifying operations and/or modifying or adding sound attenuation measures that can reasonably be expected to avoid exceeding the distances to those thresholds prior to the next planned detonation. The steps outlined here reflect the proposed action which considers a total of no more than ten detonations. A. Consistent with the measures incorporated into the proposed action, BOEM, BSEE, and USACE must require and The applicant must implement SFV for all UXO/MEC detonations (see also Terms and Conditions 8.d. below) in accordance with the additional requirements specified here. If any of the SFV measurements from any detonation indicate that the distance to any isopleth of concern is greater than those modeled assuming 10 dB attenuation (see Tables 7.1.27, 7.1.40, 7.1.47), for the next detonation The applicant must implement the following measures as applicable: i. Clearance Zones. Clearance zones must be increased to reflect the results of SFV. For every 1,500 meters that a marine mammal clearance or shutdown zone is expanded, additional PSOs must be deployed from additional platforms/vessels to ensure adequate and complete monitoring of the expanded shutdown and/or clearance zone; Park City must deploy any additional PSOs consistent with the approved Pile Driving Monitoring Plan in consideration of the size of the new zones and the species that must be monitored (i.e., sea turtles and/or whales). Use of the expanded clearance and shutdown zones must continue for additional piles until Park City requests and receives concurrence from NMFS GARFO to revert to the original clearance and shutdown zones. ii. Attenuation Measures: Park City must identify one or more additional, modified, and/or alternative noise attenuation measures or other change to the detonation plans (included in the SFV Plan) that is expected to reduce sound levels to the modeled distances. These measures must be implemented for the next detonation. Park City must provide written notification to BOEM, BSEE, USACE, NMFS OPR, and NMFS GARFO of the changes planned for the next detonation within 24 hours of implementation. iii. If Park City determines that no additional measures or modifications are feasible for implementation following a UXO detonation where SFV measurements indicate that the distances to any identified isopleth of concern are greater than those modeled assuming 10 dB attenuation (see Tables 7.1.16, 7.1.17, 7.1.31, 7.1.32, 7.1.37), and NMFS, BOEM, BSEE, and USACE agree with that determination, NMFS GARFO, NMFS OPR, BOEM, BSEE, and USACE will meet within three business days to discuss: the results of SFV monitoring, the severity of exceedance of distances to identified isopleths of concern, the species affected, modeling assumptions, and whether any triggers for reinitiation of consultation are met (50 CFR 402.16), including consideration of whether the SFV results constitute new information revealing effects of the action that may affect listed species in a manner or to an extent not previously considered in the consultation. During that period, detonations must be delayed unless a delay would create an imminent risk to human life or safety.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
121.	Construction, Operations, Decommissioning	RPM 1 & 2	To implement the requirements of RPMs 1 and 2, BOEM, BSEE, and/or USACE must require that Park City inspect and carry out appropriate maintenance on the NAS prior to every foundation installation event (i.e., for each pile driven foundation) and UXO detonation and prepare and submit a NAS inspection/performance report to NMFS GARFO and NMFS OPR. For piles for which Thorough SFV is carried out, this report must be submitted as soon as it is available, but no later than when the interim SFV report is submitted for the respective pile. Performance reports for piles with Abbreviated SFV must be submitted with the weekly pile driving reports. For UXO detonations, the report must be submitted as soon as it is available, but no later than when the interim SFV report is submitted for the UXO detonation. All reports must be submitted by email to nmfs.gar.incidental-take@noaa.gov and submitted to BSEE through TIMSWeb. A. Performance reports for each bubble curtain deployed must include water depth, current speed and direction, wind speed and direction, bubble curtain deployment/retrieval date and time, bubble curtain hose length, bubble curtain radius (distance from pile), diameter of holes and hole spacing, air supply hose length, compressor type (including rated Cubic Feet per Minute and model number), number of operational compressors, performance data from each compressor (including Revolutions Per Minute, pressure, start times, and stop times), free air delivery (cubic meter per minute), total hose air volume (cubic meter per minute meter)), schematic of Global Positioning System waypoints during hose laying, maintenance procedures performed (pressure tests, inspections, flushing, re-drilling, and any other hose or system maintenance) before and after installation and timing of those tests, and the length of time the bubble curtain was on the seafloor prior to foundation installation. Additionally, the report must include any important observations regarding performance (before, during, and after pile installation or UXO detonation), such as any observed weak areas of low pressure. The report may also include any relevant video and/or photographs of the bubble curtain(s) operating during pile driving (inclusive of relief drilling), or UXO detonation.		
122.	Construction, Operations, Decommissioning	RPM 3	To implement the requirements of RPM 3, the following conditions must be implemented: A. BOEM, BSEE, and/or USACE must require that Park City document and report project vessel trips to/from ports in the Delaware River, including the number of vessel calls to the Paulsboro Marine Terminal. This must be included in the monthly project reports submitted to NMFS GARFO over the life of the project (see Terms and Conditions 9f. below). An annual summary of project vessel calls to Paulsboro must be submitted to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) and the USACE Philadelphia District (NAPRegulatory@usace.army.mil). B. BOEM, BSEE, and/or USACE must require that Park City implement the following reporting requirements for all project vessels transiting to/from ports in the Delaware River: i. Report any sturgeon observed with injuries or mortalities along the transit route in the Delaware Bay, Delaware River, or in the vicinity of the port that the vessel is calling on to NMFS within 24 hours by submitting the form available at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null to nmfs.gar.incidental-take@noaa.gov.	Atlantic sturgeon and shortnose sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			ii. Collect any dead sturgeon observed in the vicinity of the port that the vessel is calling on and hold in cold storage until proper disposal procedures are discussed with NMFS GARFO. iii. Complete procedures for genetic sampling of any collected dead Atlantic sturgeon that are over 75 cm. More information on submitting genetic samples is included in Term and Condition 6a below. These requirements and instructions are consistent with the requirements of the RPMs and Terms and Conditions of the 2023 Paulsboro Opinion.		
123.	Construction	RPM 4	To implement the requirements of RPM 4, BOEM, BSEE, and/or USACE must require that Park City prepare and submit interim and final SFV reports to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) and BSEE (via TIMSWeb and notification email to protectedspecies@bsee.gov) as outlined here: A. SFV Interim Reports - Foundation Installation and UXO/MEC detonation. BOEM, BSEE, and USACE must require Park City to provide the initial results of the SFV measurements to NMFS GARFO and NMFS OPR in an interim report as soon as it is available but no later than 48 hours after the installation of each pile for which thorough SFV is carried out and for UXO detonation, no later than 48 hours after the detonation. If technical or other issues prevent submission within 48 hours, Park City must notify BOEM, BSEE, and NMFS GARFO within that 48-hour period with the reasons for delay and provide an anticipated schedule for submission of the report. The interim report must include data from hydrophones identified for interim reporting in the SFV Plan and include a summary of pile installation activities (pile diameter, pile weight, pile length, water depth, sediment type, hammer type, total strikes, total installation time [start time, end time], duration of pile driving, max single strike energy, NAS deployments), pile location, recorder locations, modeled and measured distances to thresholds, received levels (rms, peak, and SEL) results from Conductivity, Temperature, and Depth casts/sound velocity profiles, signal and kurtosis rise times, pile driving plots, activity logs, weather conditions. Additionally, any important sound attenuation device malfunctions (suspected or definite), must be summarized and substantiated with data (e.g., photos, positions, environmental data, directions, etc.). Such malfunctions include gaps in the bubble curtain, significant drifting of the bubble curtain, and any other issues which may indicate sub-optimal mitigation performance or are used by Park City to explain performance issues. Requirements for actions to be taken based on the results of the SFV are identified above. B. In addition to the requirements above, all Thorough SFV reports for foundation installation must include a table with levels expected at 750 meters for subsequent piles for which that thorough SFV is intended to represent (e.g., a 12 meters monopile installed with a 6,000-kJ hammer with just impact driving), to be compared against measurements from Abbreviated SFV monitoring. Expected single strike metrics are the maxima of the 95th-percentile of measured unweighted SPL, SEL, and Peak. The expected cumulative metric of unweighted SEL for all impact pile-driving strikes must also be reported and compared. These tables must include the highest levels from Thorough SFVs for which isopleths were calculated to be within modeled ranges, assuming 10 dB attenuation rounded up to the next integer decibel, both actual measurements at 750 meters, and fits based on measurements from recorders at other ranges. The highest levels in these tables, rounded to the next whole decibel, will be the "expected levels" to which Abbreviated SFV results must be compared. C. All Abbreviated SFV reports must include the results from the hydrophones at 750m and a comparison to the expected levels at 750 meters based on the previously completed thorough SFV for comparable pile type and installation method. Abbreviated SFV reports must be submitted with the weekly pile driving report. D. SFV Final Reports - The final results of Thorough SFV for monopile and pin pile installations must be submitted as soon as possible, but no later than within 90 days following completion of pile driving for which the Thorough SFV was carried out. The final results of Thorough SFV for UXO detonations must be submitted as soon as possible, but no later than within 90 days following completion of each UXO detonation. Within 60 days of the end of each construction season, Park City must compile and submit all final Abbreviated SFV reports.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
124.	Construction	RPM 4	To implement the requirements of RPM 4, BOEM, BSEE, and/or USACE must require that Park City file a report with NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) and BSEE (via TIMSWeb and notification email to protectedspecies@bsee.gov) in the event that any ESA listed species is observed within the identified shutdown zone during active pile driving (vibratory or impact) or drilling. This report must be filed within 48 hours of the incident and include the following: description of the activity (i.e., drilling, vibratory or impact pile driving) and duration of pile driving or drilling prior to the detection of the animal(s), location of PSOs and any factors that impaired visibility or detection ability, time of first and last detection of the animal(s), distance of animal at first detection, closest point of approach of animal to pile, behavioral observations of the animal(s), time the PSO called for shutdown, hammer log (number of strikes, hammer energy), time the pile driving began and stopped, and any measures implemented (e.g., reduced hammer energy) prior to shut down. If shutdown was determined not to be feasible, the report must include an explanation for that determination and the measures that were implemented (e.g., reduced hammer energy).	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
125.	Construction, Operations, Decommissioning	RPM 4	To implement the requirements of RPM 4, BOEM, BSEE, USACE, must require Park City to implement the following reporting requirements necessary to document the amount or extent of incidental take that occurs during all phases of the proposed action. Unless otherwise specified all reports must be submitted to NMFS GARFO via e-mail (nmfs.gar.incidental-take@Noaa.gov) and BSEE via TIMSWeb. A. All observations or interactions with sea turtles or sturgeon that occur during the fisheries monitoring surveys must be reported within 48 hours to NMFS GARFO Protected Resources Division by email (nmfs.gar.incidental-take@noaa.gov) Take reports should reference the proposed Project and include the Take Report Form available on NMFS webpage (https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null). Reports of Atlantic sturgeon take must include a statement as to whether a fin clip sample for genetic sampling was taken. Fin clip samples are required in all cases of interactions and handling of Atlantic sturgeon to document the distinct population segment of origin; the only exception to this requirement is when additional handling of the sturgeon would result in an imminent risk of injury to the fish or the survey personnel handling the fish: NMFS expects such incidents to be limited to capture and handling of sturgeon in extreme weather. Instructions for fin clips and associated metadata are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic, under the "Sturgeon Genetics Sampling" heading. B. All sightings or acoustic detections of NARWs must be reported immediately (no later than 24 hours). PAM detections and sightings of right whales with no visible injuries or entanglement must be reported as described in (i) below. Reporting requirements for suspected vessel strikes and injured/dead right whales are in (c) and (d) below.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			i. If a NARW is sighted with no visible injuries or entanglement or is detected via PAM at any time by project PSOs/PAM Operators or project personnel, Park City must immediately report the sighting or acoustic detection to NMFS; if immediate reporting is not possible, the report must be submitted as soon as possible but no later than 24 hours after the initial sighting or acoustic detection. a. To report the sighting or acoustic detection, download and complete the Real-Time North Atlantic Right Whale Reporting Template spreadsheet found here: https://www.fisheries.noaa.gov/resource/document/template-datasheet-real-time-north-atlantic-right-whale-acoustic-and-visual. Save the spreadsheet as a .csv file and email it to NMFS NEFSC-PSD (ne.rw.survey@noaa.gov), NMFS GARFO- Protected Resource Division (nmfs.gar.incidental-take@noaa.gov), and NMFS OPR (PR.ITP.MonitoringReports@noaa.gov). b. If unable to report a sighting through the spreadsheet within 24 hours, call the relevant regional hotline (Greater Atlantic Region [Maine through Virginia] Hotline 866-755-6622; Southeast Hotline 877-WHALE-HELP) with the observation information provided below (PAM detections are not reported to the Hotline). c. Observation information: Report the following information: the time (note time format), date (MM/DD/YYYY), location (latitude/longitude in decimal degrees; coordinate system used) of the observation, number of whales, animal description/certainty of observation (follow up with photos/video if taken), reporter's contact information, and lease area number/project name, PSO/personnel name who made the observation, and PSO provider company (if applicable) (PAM detections are not reported to the Hotline). d. If unable to report via the template or the regional hotline, enter the sighting via the WhaleAlert app (http://www.whalealert.org/). If this is not possible, report the sighting to the USCG via channel 16. The report to the Coast Guard must include the same information as would be reported to the Hotline (see above). PAM detections are not reported to WhaleAlert or the USCG. C. In the event of a suspected or confirmed vessel strike of any ESA listed species (e.g. marine mammal, sea turtle, listed fish) by any vessel associated with the Project or other means by which project activities caused a non-auditory injury or death of a ESA listed species, Park City must immediately report the incident to NMFS (at the phone numbers and email addresses identified below) and BSEE (via TIMSWeb and notification email to (protectedspecies@bsee.gov). Reports to NMFS must be made by phone and email: i. Phone: If in the Greater Atlantic Region (ME-VA): the NMFS Greater Atlantic Stranding Hotline (866-755-6622); in the Southeast Region (NC-FL): the NMFS Southeast Stranding Hotline (877-942-5343). ii. Email: GARFO (nmfs.gar.incidental-take@noaa.gov), and if in the Southeast region (NC-FL), also to NMFS Southeast Regional Office (secmammalreports@noaa.gov) The report must include: (A) Time, date, and location (coordinates) of the incident; (B) Species identification (if known) or description of the animal(s) involved (i.e., identifiable features including animal color, presence of dorsal fin, body shape and size); (C) Vessel strike reporter information (name, affiliation, email for person completing the report); (D) Vessel strike witness (if different than reporter) information (name, affiliation, phone number, platform for person witnessing the event); (E) Vessel name and/or Maritime Mobile Service Identify number; (F) Vessel size and motor configuration (inboard, outboard, jet propulsion); (G) Vessel's speed leading up to and during the incident; (H) Vessel's course/heading and what operations were being conducted (if applicable); (I) Part of vessel that struck whale (if known); (J) Vessel damage notes; (K) Status of all sound sources in use; (L) If animal was seen before strike event; (M) behavior of animal before strike event; (N) 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; (O) Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike; (P) Estimated (or actual, if known) size and length of animal that was struck; (Q) Description of the behavior of the marine mammal immediately preceding and following the strike; (R) If available, description of the presence and behavior of any other marine mammals immediately preceding the strike; (S) Other animal details if known (e.g., length, sex, age class); (T) Behavior or estimated fate of the animal post-strike (e.g., dead, injured but alive, injured and moving, external visible wounds (linear wounds, propeller wounds, non-cutting blunt-force trauma wounds), blood or tissue observed in the water, status unknown, disappeared); (U) To the extent practicable, photographs or video footage of the animal(s); and (V) Any additional notes the witness may have from the interaction. For any numerical values provided (i.e., location, animal length, vessel length etc.), please provide if values are actual or estimated. D. In the event that any PSO or other project personnel, including any project vessel operator or crew, observe or identify a stranded, entangled, injured, or dead ESA listed species (e.g. marine mammal, sea turtle, listed fish), Park City must immediately report the observation to NMFS (by phone (marine mammals and turtles only) and email (marine mammal, sea turtle, listed fish) and BSEE (via TIMSWeb and notification email to (protectedspecies@bsee.gov): i. Phone: If in the Greater Atlantic Region (ME-VA):e NMFS Greater Atlantic Stranding Hotline (866-755-6622); in the Southeast Region (NC-FL) call the NMFS Southeast Stranding Hotline (877-942-5343). Note, the stranding hotline may request the report be sent to the local stranding network response team. ii. Email: if in the Greater Atlantic region (ME to VA) to GARFO (nmfs.gar.incidental-take@noaa.gov) or if in the Southeast region (NC-FL) to NMFS Southeast Regional Office (secmammalreports@noaa.gov). The report must include: (A) Contact information (name, phone number, etc.), time, date, and location (coordinates) of the first discovery (and updated location information if known and applicable); (B) Species identification (if known) or description of the animal(s) involved; (C) Condition of the animal(s) (including carcass condition if the animal is dead); (D) Observed behaviors of the animal(s), if alive; (E) If available, photographs or video footage of the animal(s); and (F) General circumstances under which the animal was discovered. Staff responding to the hotline call will provide any instructions for handling or disposing of any injured or dead animals, which may include coordination of transport to shore, particularly for injured sea turtles. E. Park City must compile and submit weekly reports during each month that foundation installation occurs that document: the foundation/pile ID, type of pile, pile diameter, start and finish time of each drilling and pile driving event, hammer log (number of strikes, max hammer energy, duration of piling) per pile, any changes to NASs and/or hammer schedule, details on the deployment of PSOs and PAM operators, including the start and stop time of associated observation periods by the PSOs and PAM Operators, and a record of all observations/detections of marine mammals and sea turtles including time (UTC) of sighting/detection, species ID, behavior, distance (meters) from vessel to animal at time of sighting/detection (meters), animal distance (meters) from pile installation vessel, vessel/project activity at time of sighting/detection, platform/vessel name, and mitigation measures taken (if any) and reason. Sightings/detections during pile driving activities (clearance, active pile driving, post-pile driving) and all other (transit, opportunistic, etc.) sightings/detection must be reported and identified as such. The weekly reports must also confirm that the required SFV was carried out for each pile and that results were reviewed on the required timelines. Abbreviated SFV reports must be appended to the weekly report. These weekly reports must be submitted to		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			NMFS GARFO (nmfs.gar.incidental-take@noaa.gov), BOEM, and BSEE by Park City or the PSO providers and can consist of quality assurance/quality controlled raw data. Weekly reports are due on Wednesday for the activities occurring the previous week (Sunday - Saturday, local time). F. Starting in the first month that in-water activities occur (e.g., cable installation, fisheries surveys), Park City must compile and submit monthly reports that include a summary of all project activities carried out in the previous month, including dates and location of any fisheries surveys carried out, vessel transits (name, type of vessel, number of transits, vessel activity, and route (origin and destination, including transits from all ports, foreign and domestic), cable installation activities (including sea to shore transition), number of foundations installed and pile IDs, UXO detonation, and all sightings/detections of ESA listed whales, sea turtles, and sturgeon. Sightings/detections must include species ID, time, date, initial detection distance, vessel/platform name, vessel activity, vessel speed, bearing to animal, project activity, and any mitigation measures taken as a result of those observations. These reports must be submitted to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) and BSEE (TIMSWeb and protectedspecies@bsee.gov) and are due on the 15th of the month for the previous month. G. Park City must submit to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) an annual report describing all activities carried out to implement their Fisheries Research and Monitoring Plan. This report must include a summary of all activities conducted, the dates and locations of all fisheries surveys, including location and duration for all trawl surveys summarized by month, number of vessel transits inclusive of port of origin and destination, and a summary table of any observations and captures of ESA listed species during these surveys. The report must also summarize all acoustic telemetry and benthic monitoring activities that occurred, inclusive of vessel transits. Each annual report is due by February 15 (i.e., the report for 2024 activities is due by February 15, 2025). BOEM and BSEE must require Park City to submit full detection data, metadata, and location of recorders (or Global Positioning System tracks, if applicable) from all real-time hydrophones used for monitoring during construction within 90 calendar days after the completion of foundation installation and UXO detonations have ended for the calendar year (i.e., if the last foundation of construction year 1 is installed on November 30, the report is due by March 1 of the following year). Reporting must use the webform templates on the NMFS Passive Acoustic Reporting System website at https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates. BOEM and BSEE, must require Park City to submit the full acoustic recordings from all the real-time hydrophones to the National Centers for Environmental Information for archiving within 90 calendar days after pile-driving has ended and instruments have been pulled from the water. Archiving guidelines outlined here (https://www.ncei.noaa.gov/products/passive-acoustic-data#tab-3561) must be followed. Confirmation of both submittals must be sent to NMFS GARFO via email.		
126.	Construction, Operations, Decommissioning	RPM 4	To implement the requirements of RPM 4 and to facilitate monitoring of the incidental take exemption for sea turtles, BOEM, BSEE, USACE, and NMFS must meet twice annually to review sea turtle observation records. These meetings/conference calls will be held in September (to review observations through August of that year) and December (to review observations from September to November) and will use the best available information on sea turtle presence, distribution, and abundance, proposed Project vessel activity, and observations to estimate the total number of sea turtle vessel strikes in the action area that are attributable to proposed Project operations.	Sea Turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
127.	Construction	RPM 4	To implement the requirements of RPM 4, within 10 business days of BOEM, BSEE, and/or USACE obtaining updated information on project plans (e.g., as obtained through a relevant facility design report and/or fabrication and installation report, or other submission), BOEM, BSEE, and/or USACE must provide NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) with the following information: number, size, and type of foundations to be installed to support WTGs and ESPs for each project; the proposed construction schedule (i.e., months when pile driving is planned) for each project, and any available updates on anticipated vessel transit routes (e.g., any changes to the ports identified for use by project vessels, confirmation of location of operations and maintenance facility) that will be used by project vessels. This information may be provided in separate submissions for Project 1 and Project 2. NMFS GARFO will review this information and, to the maximum extent practicable, within 10 business days of receipt will request a meeting with BOEM, BSEE, and USACE if there is any indication that there are changes to the proposed action that would cause an effect to listed species or critical habitat that was not considered in this Opinion, including the amount or extent of predicted take, such that any potential trigger for reinitiation of consultation can be discussed with the relevant action agencies.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
128.	Operations	RPM 4	To implement RPM 4 for trawl surveys: A. At least one of the survey staff onboard the trawl survey vessels must have completed NMFS NEFOP training within the last 5 years or other training in protected species identification and safe handling (inclusive of taking genetic samples from Atlantic sturgeon); documentation of training must be submitted to NMFS GARFO at least 7 calendar days prior to the start of the trawl surveys and at any later time that a different NEFOP trained observer is deployed on the survey. B. If Park City or their contractors will deploy non-NEFOP trained survey personnel in lieu of NEFOP-trained observers, BOEM, BSEE, and/or Park City must submit a plan to NMFS describing the training that will be provided to those survey observers. This Observer Training Plan for Trawl Surveys must be submitted as soon as possible after issuance of this Opinion but no later than 15 calendar days prior to the start of trawl surveys for which a non-NEFOP trained observer will be deployed. BOEM, BSEE, and Park City must obtain NMFS GARFO's concurrence with this observer training plan prior to the deployment of the non-NEFOP trained observer on any trawl surveys. This plan must include a description of the elements of the training (i.e., curriculum, virtual or hands on, etc.) and identify who will carry out the training and their qualifications. Once the training is complete, confirmation of the training and a list of trained survey staff must be submitted to NMFS; this list must be updated if additional staff are trained for future surveys. In all cases, a list of trained survey staff must be submitted to NMFS at least one business day prior to the beginning of the survey.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
129.	Construction	RPM 5	To implement RPM 5, BOEM, BSEE, and/or USACE must require, and Park City must prepare and submit the plans identified below in sufficient time to allow for review and any required approval prior to the planned start date for the associated activities. All plans must be submitted to NMFS GARFO at nmfs.gar.incidental-take@noaa.gov as well as to BOEM (renewable_reporting@boem.gov), BSEE (via TIMSWeb with a notification email to protectedspecies@bsee.gov), and USACE (cenae-r-@usace.army.mil). A. Any of the identified plans can be combined such that a single submitted plan addresses multiple requirements provided that the plan clearly identifies which requirements it is addressing. B. Within 60 days of issuance of this BO, Park City must schedule a meeting with NMFS GARFO to: review the plan requirements, discuss the review/approval process, and develop a schedule for when plans can be expected to be submitted for review.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			C. Between 30 and 90 days before the planned start of foundation installation each year, Park City must meet with NMFS GARFO, BOEM, BSEE, USACE, and NMFS OPR to review the construction plans and schedule for the upcoming construction season, and review requirements for reporting and notification protocols, and Thorough and Abbreviated SFV requirements. D. All plans must be submitted at least 180 days in advance of the planned start of relevant activities (e.g., the foundation installation monitoring plan must be submitted at least 180 days before the planned date for installation of the first pile). For each plan, within 45 calendar days of receipt of the plan, NMFS GARFO will provide comments to BOEM, BSEE, and Park City, including a determination as to whether the plan is consistent with the requirements outlined in this ITS and/or in Section 3 of this Opinion. If the plan is complete and is determined to be consistent with the identified requirements, NMFS GARFO will provide concurrence with the plan. If the plan is determined to be inconsistent with these requirements (e.g., if required information is missing), Park City must resubmit a modified plan that addresses the identified issues within 30 days of the receipt of the comments. For all subsequent drafts, Park City must provide for at least 10 day calendar days for review and comment. i. Marine Mammal and Sea Turtle Monitoring Plan – Foundation Installation and UXO/MEC detonation. BOEM, BSEE, and/or Park City must submit this Plan (or Plans if separate plans are prepared for foundation installation and UXO/MEC detonation) to NMFS GARFO at least 180 calendar days before the respective activity is planned to begin (i.e., if foundation installation or UXO detonation is planned for May 1, the plan must be submitted no later than November 1 of the preceding year). BOEM, BSEE, and Park City must obtain NMFS GARFO's concurrence with this Plan(s) prior to the start of any drilling or pile driving for foundation installation and before any UXO/MEC detonation. a. The Plan(s) must include: a description of how all relevant mitigation and monitoring requirements contained in the ITS and those included as part of the proposed action will be implemented; a pile driving installation summary and sequence of events; a description of all monitoring equipment and evidence (i.e., manufacturer's specifications, reports, testing) that it can be used to effectively monitor and detect ESA listed marine mammals and sea turtles in the identified clearance and shutdown zones (i.e., field data demonstrating reliable and consistent ability to detect ESA listed large whales and sea turtles at the relevant distances in the conditions planned for use); communications and reporting details; and PSO monitoring and mitigation protocols (including number and location of PSOs) for effective observation and documentation of sea turtles and ESA listed marine mammals during all foundation installation events and UXO/MEC detonations. b. The Plan(s) must demonstrate sufficient PSO and PAM Operator staffing (in accordance with watch shifts), PSO and PAM Operator schedules, and contingency plans for instances if additional PSOs and PAM Operators are required including any expansion of clearance and/or shutdown zones that may be required as a result of SFV. c. The Plan(s) must contain a thorough description of how Park City will monitor foundation installation activities (drilling, vibratory and impact pile driving) during reduced visibility conditions (e.g. rain, fog) and in other low visibility conditions, including proof of the efficacy of monitoring devices (e.g., mounted thermal/infrared camera systems, hand-held or wearable night vision devices, spotlights) in detecting ESA listed marine mammals and sea turtles over the full extent of the required clearance and shutdown zones, including demonstration that the full extent of the minimum visibility zones can be effectively and reliably monitored. The Plan must identify the efficacy of the technology at detecting marine mammals and sea turtles in the clearance and shutdown zones under all the various conditions anticipated during construction, including varying weather conditions, sea states, and in consideration of the use of artificial lighting. d. The Plan must contain a thorough description of how Park City will monitor foundation installation activities during daytime when unexpected changes to lighting or weather occur during pile driving that prevent visual monitoring of the full extent of the clearance and shutdown zones. e. The plan must describe how Park City would determine the number of sea turtles exposed to noise above the 175 dB harassment threshold during foundation installation and how Park City would determine the number of ESA listed whales exposed to noise above the Level B harassment threshold during foundation installation and UXO detonation (in consideration of modeling that indicates that distances to the level B harassment threshold may extend beyond the clearance and shutdown zones being monitored by PSOs). ii. Nighttime Monitoring Plan – Foundation Installation. BOEM, BSEE, and/or Park City must submit this Plan to NMFS GARFO at least 180 calendar days before foundation installation is planned to begin. This plan can be included as a sub-section of the Marine Mammal and Sea Turtle Monitoring Plan addressed above or as a stand-alone plan. This Plan(s) must contain a thorough description of how Park City will monitor foundation installation activities (drilling, vibratory and impact pile driving) and at night, including proof of the efficacy of monitoring devices (e.g., mounted thermal/infrared camera systems, hand-held or wearable night vision devices, spotlights) in detecting ESA listed marine mammals and sea turtles over the full extent of the required clearance and shutdown zones, including demonstration that the full extent of the minimum visibility zones can be effectively and reliably monitored. The Plan must identify the efficacy of the technology at detecting marine mammals and sea turtles in the clearance and shutdown zones under all the various conditions anticipated during construction, including varying weather conditions, sea states, and in consideration of the use of artificial lighting. If the plan does not include a full description of the proposed technology, monitoring methodology, and data demonstrating to NMFS GARFO's satisfaction that marine mammals and sea turtles can reliably and effectively be detected within the clearance and shutdown zones for monopiles and jacket foundations before and during foundation installation (drilling, vibratory and impact pile driving), nighttime foundation installation may not occur; the only exception would be if safety necessitates continuing pile installation after dark for a foundation that was initiated 1.5 hours prior to civil sunset, in which case the Low Visibility components of the Pile Driving Monitoring Plan would be implemented. iii. PAM Plan for Pile Driving and UXO/MEC Detonation. BOEM, BSEE, and/or Park City must submit this Plan to NMFS GARFO at least 180 calendar days before either Pile Driving or UXO/MEC detonation is planned. This plan can be included as a sub-section of the Marine Mammal and Sea Turtle Monitoring Plan addressed above. BOEM, BSEE, and Park City must obtain NMFS GARFO's concurrence with this Plan prior to the start of any foundation installation or UXO/MEC Detonation. The Plan must include a description of all proposed PAM equipment and hardware, the calibration data, bandwidth capability and sensitivity of hydrophones, and address how the proposed PAM will follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind (Van Parijs et al. 2021). The Plan must describe and include all procedures, documentation, and protocols including information (i.e., testing, reports, equipment specifications) to support that it will be able to detect vocalizing whales within the clearance and shutdown zones, including deployment locations, procedures, detection review methodology, and protocols; hydrophone detection ranges with and without foundation installation activities and data supporting those ranges; communication time between call and detection, and data transmission rates between PAM Operator and PSOs on the pile driving vessel; where PAM Operators will be stationed relative to hydrophones and		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			PSOs on pile driving vessel calling for delay/shutdowns; and a full description of all proposed software, call detectors, and filters. The Plan must also incorporate the requirements relative to NARW reporting in Terms and Conditions 9. iv. Sound Field Verification Plan - Foundation Installation and UXO/MEC detonation. BOEM, BSEE, and USACE must require Park City to submit this Plan (or Plans if separate Foundation Installation and UXO/MEC plans are prepared) to NMFS GARFO at least 180 calendar days before pile driving for foundations and UXO/MEC detonation is planned to begin. BOEM, BSEE, and Park City must obtain NMFS GARFO's concurrence with this Plan(s) prior to the start of foundation installation and UXO detonations. The Plan must detail all plans and procedures for sound attenuation, including procedures for adjusting and optimizing the NAS(s), maintenance procedures and timelines, and detail the available contingency noise attenuation measures/systems if distances to modeled isopleths of concern are exceeded (as documented during SFV). a. Foundation Installation: The plan must describe how Park City will conduct the required Thorough SFV (Terms and Conditions 1a) for each of the required foundation types, installation methodologies, and locations. In the case that the foundation sites planned for Thorough SFV are determined to not be representative of all other foundation installation sites for a scenario, Park City must include information on how additional sites will be selected for Thorough SFV. Park City must provide justification for why these locations are representative of the scenario modeled. The plan must describe how Park City will conduct the required Abbreviated SFV, inclusive of requirements to review results within 24 hours and triggers for Thorough SFV. The Plan must provide a table of the identification number and coordinates of each foundation location, and specify the underwater acoustics analysis model scenario against which each foundation location's SFV results will be compared. The Plan(s) must also include the piling schedule and sequence of events, communication and reporting protocols, and methodology for collecting, analyzing, and preparing SFV data for submission to NMFS, including instrument deployment, locations of all hydrophones (including direction and distance from the pile), hydrophone sensitivity, recorder/measurement layout, and analysis methods. The Plan must also identify the number and distance of relative location of hydrophones for Thorough and Abbreviated SFV. The plan must include a template of the interim report to be submitted and describe the all the information that will be reported in the SFV Interim Reports including the number, location, depth, distance, and predicted and actual isopleth distances that will be included in the final report(s). The Plan must describe how the interim SFV report results will be evaluated against the modeled results, including which modeled scenario the results will be reported against, and include a decision tree of what happens if measured values exceed predicted values. The Plan must address how Park City will implement the measures associated with the required SFV which includes, but is not limited to, identifying additional or modified noise attenuation measures (e.g., additional noise attenuation device, adjust hammer operations, adjust or modify the noise mitigation system) that will be applied to reduce sound levels if measured distances are greater than those modeled as well as implementation of any expanded clearance or shutdown zones, including deployment of additional PSOs. b. UXO Detonation: The plan must describe how Park City will conduct the required Thorough SFV for all planned UXO detonations (Terms and Conditions 4). Thorough SFV consists of: SFV measurements made at a minimum of four distances from the detonation, along a single transect, in the direction of lowest transmission loss (i.e., projected lowest transmission loss coefficient), including, but not limited to, 750 meters and three additional ranges selected such that measurement of identified isopleths are accurate, feasible, and avoid extrapolation. At least one additional measurement at an azimuth 90 degrees from the array at approximately 750 meters must be made. At each location, there must be a near bottom and mid-water column hydrophone (measurement systems). The Plan must describe how the interim SFV report results will be evaluated against the modeled results and decision tree of what happens if measured values exceed predicted values. The Plan must address how Park City will implement the measures associated with the required SFV which includes, but is not limited to, identifying additional or modified noise attenuation measures (e.g., additional noise attenuation device, adjust hammer operations, adjust or modify the noise mitigation system) that will be applied to reduce sound levels if measured distances are greater than those modeled as well as implementation of any expanded clearance or shutdown zones, including deployment of additional PSOs. i. Vessel Strike Avoidance Plan. Park City must submit this plan to NMFS GARFO as soon as possible after issuance of this BO but no later than 180 days prior to the planned mobilization of any vessels operated by or under contract to the applicant for the New England Wind Project (i.e., any vessel associated with construction, operations and maintenance, or decommissioning activities described in this Opinion). The Plan must include: an acknowledgement of the vessels that are subject to the plan; all relevant mitigation and monitoring measures for listed species inclusive of a summary of all applicable vessel speed and approach restrictions in different operational areas; vessel-based observer protocols for transiting vessels; communication and reporting plans; and a description of proposed alternative monitoring equipment to allow lookouts/PSOs to observe vessel strike avoidance zones in varying weather conditions, sea states, darkness, and in consideration of the use of artificial lighting. NMFS GARFO will review this plan and identify any inconsistencies with the requirements for vessel strike avoidance required by regulation or otherwise incorporated into the proposed action considered in the BO. With the exception noted below, NMFS GARFO's concurrence with this plan is not required prior to vessel mobilization. a. If Park City plans to implement PAM in any transit corridor to allow vessel transit above 10 knots, Park City must prepare a plan (a standalone plan or supplement to the Vessel Strike Avoidance Plan) that describes: the location of each transit corridor (with a map); how PAM, in combination with visual observations, will be conducted to ensure highly effective monitoring for the presence of right whales in the transit corridor; and, the protocols that will be in place for vessel speed restrictions following detection of a right whale via PAM or visual observation. This plan must be provided to NMFS GARFO for review at least 180 days in advance of planned deployment of the PAM system. PAM information should follow what is required to be submitted for the PAM Plan in Terms and Conditions 13.c. BOEM, BSEE, and Park City must receive NMFS GARFO's concurrence with this plan prior to implementation of the PAM-monitored transit corridor.		
130.	Construction, Operations, Decommissioning	RPM 6	To implement the requirements of RPM 6, BOEM, BSEE, NMFS OPR, and USACE must exercise their authorities to assess the implementation of measures to avoid, minimize, monitor, and report incidental take of ESA listed species during activities described in this Opinion. These agencies shall immediately exercise their respective authorities to take effective action to ensure prompt implementation and compliance if Park City is not complying with: any avoidance, minimization, and monitoring measures incorporated into the proposed action or any term and condition(s) specified in this statement, as currently drafted or otherwise amended in agreement between these agencies and NMFS; if agencies fail to do so, the protective coverage of Section 7(o)(2) may lapse.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
131.	Construction, Operations, Decommissioning	RPM 6	To implement the requirements of RPM 6, Park City must consent to on-site observation and inspections by Federal agency personnel (including NOAA personnel) during activities described in the BO, for the purposes of evaluating the effectiveness and implementation of measures designed to minimize or monitor incidental take.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
132.	Construction, Operations, Decommissioning	RPM 6	To implement the requirements of RPM 6, Park City, BOEM, BSEE, NMFS OPR, and USACE must immediately notify NMFS GARFO of any identified or suspected non-compliance with any measure outlined in this ITS or in any measure incorporated into the proposed action, including measures included in the Final MMPA authorization. This includes the suspected or identified failure in effectiveness of any such measure. This notification must be submitted as soon as the issue is identified to nmfs.gar.incidental-take@noaa.gov and must include a description of the non-compliance or failure of effectiveness of the measure, the date the issue was identified, and any corrective actions that were taken. The report of non-compliance must be followed within 48 hours with a request to meet with NMFS GARFO to discuss the report and seek concurrence from NMFS GARFO on the corrective measures. Neither the applicant nor any action agency may interfere with any reporting to NMFS by a PSO or other personnel of any identified or suspected non-compliance with any such measures or any identified or suspected incidental take.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
CRs					
133.	Construction	CR 1	Work with the applicant to develop a construction schedule that further reduces potential exposure of NARWs to noise from pile driving including avoiding impact pile driving and UXO detonation in May and December.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
134.	Operations	CR 2	Collect data to add to the limited information on underwater noise generated during operations of the direct drive wind turbines in the action area. i. A study to document operational noise of WTGs during a variety of wind and weather conditions should be carried out.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
135.	Construction, Operations, Decommissioning	CR 3	Support research and development of technology to aid in the minimization of risk of vessel strikes on marine mammals, sea turtles, and Atlantic sturgeon.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
136.	Construction, Operations, Decommissioning	CR 4	Support development of regional monitoring of project and cumulative effects through the Regional Wildlife Science Collaborative for Offshore Wind.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
137.	Construction, Operations, Decommissioning	CR 5	Work with the NEFSC to support robust monitoring and study design with adequate sample sizes, appropriate spatial and temporal coverage, and proper design allowing the detection of potential impacts of offshore wind projects on a wide range of ecological and oceanographic conditions including protected species distribution, prey distribution, pelagic habitat, and habitat usage.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
138.	Construction, Operations, Decommissioning	CR 6	Support research into understanding the effects of offshore wind on regional oceanic and atmospheric conditions through modeling and data collection, and assessment of potential impacts on protected species, their habitats, and distribution of zooplankton and other prey.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
139.	Operations	CR 7	Support the continuation of aerial surveys for post-construction monitoring of listed species in the SWDA and surrounding waters, and methods for survey adaptation to the presence of wind turbines.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
140.	Construction, Operations	CR 8	Support research on construction and operational impacts to protected species distribution, particularly the NARW and other listed whales. Conduct monitoring pre/during/post construction, including long-term monitoring during the operational phase, including sound sources associated with turbine maintenance (e.g., service vessels), to understand any changes in protected species distribution and habitat use in southern New England.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
141.	Construction, Operations, Decommissioning	CR 9	Support the deployment of acoustic tags on sea turtles and sturgeon and deployment and maintenance of a receiver array in the SWDA and surrounding waters.	Atlantic sturgeon (3.6), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
142.	Construction, Operations, Decommissioning	CR 10	Support research regarding the abundance and distribution of Atlantic sturgeon in the SWDA and surrounding region in order to understand the distribution and habitat use and aid in density modeling efforts, including the continued use of acoustic telemetry networks to monitor for tagged fish.	Atlantic sturgeon (3.6)	

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
143.	Construction, Operations, Decommissioning	CR 11	Require the applicant to send all acoustic telemetry metadata and detections to the Mid-Atlantic Acoustic Telemetry Observation System database via https://matos.asascience.com/ for coordinated tracking of marine species over broader spatial scales in U.S. Animal Tracking Network and Ocean Tracking Network.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
144.	Construction, Operations, Decommissioning	CR 12	Conduct or support long-term ecological monitoring to document the changes to the ecological communities on, around, and between foundations and other benthic areas disturbed by the proposed Project.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
145.	Construction, Operations, Decommissioning	CR 13	Develop or support the development of a PAM array in the SWDA to monitor changes in ambient noise and use of the area by baleen whales (and other marine mammals) during the life of the Project, including construction, and to detect small-scale changes at the scale of the SWDA. Bottom mounted recorders should be deployed at a maximum of 20 kilometers distance from each other throughout the given study area in order to ensure near to complete coverage of the area over which NARWs and other baleen whales can be heard. See Van Parijs et al. 2021 for specific details. Resulting data products should be provided according to https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates.	Marine mammals (3.7)	BOEM BSEE NMFS (OPR) USACE
146.	Construction, Operations, Decommissioning	CR 14	Support the development of a regional PAM network across lease areas to monitor long-term changes in baleen whale distribution and habitat use. A regional PAM network should consider adequate array/hydrophone design, equipment, and data evaluation to understand changes over the spatial scales that are relevant to these species for the duration of these projects, as well as the storage and dissemination of these data.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
147.	Construction, Operations, Decommissioning	CR 15	Monitor changes in commercial fishing activity to detect changes in bycatch or entanglement rates of protected species, particularly the NARW, and support the adaptation of ropeless fishing practices where necessary. Conduct regular surveys and removal of marine debris from project infrastructure.	Commercial Fisheries and For-Hire Recreational Fishing (3.9), Marine mammals (3.7)	BOEM BSEE NMFS (OPR) USACE
148.	Construction, Operations, Decommissioning	CR 16	Provide support to groups that participate in regional stranding networks.	Atlantic sturgeon (3.6), Marine mammals (3.7), and sea turtles (3.8)	BOEM BSEE NMFS (OPR) USACE
Draft NMFS Proposed Incidental Take Regulations Pursuant to the MMPA Issued to BOEM for Consideration on June 8, 2023[d]					
General Conditions					
149.	Construction	General Conditions	1. A copy of any issued LOA must be in the possession of the applicant and its designees, all vessel operators, visual PSOs, PAM operators, pile driver operators, and any other relevant designees operating under the authority of the issued LOA; 2. The applicant must conduct briefings between construction supervisors, construction crews, and the PSO and PAM team prior to the start of all in-water construction activities and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring and reporting protocols, and operational procedures. A simple guide must be included with the Marine Mammal Monitoring Plan to aid personnel in identifying species if they are observed in the vicinity of the project area; 3. Prior to and when conducting any in-water activities and vessel operations, the applicant's personnel and contractors (e.g., vessel operators, PSOs) must use available sources of information on NARW presence in or near the project area including daily monitoring of the Right Whale Sightings Advisory System, and monitoring of 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 operators; 4. The applicant must ensure that any visual observations of an ESA-listed marine mammal are communicated to on-duty PSOs, PAM operator(s), and vessel captains during the concurrent use of multiple project-associated vessels (of any size; e.g., construction surveys, crew/supply transfers, etc.); 5. The applicant must establish and implement clearance and shutdown zones as described in the LOA; 6. The applicant must instruct all vessel personnel regarding the authority of the PSO(s). Any disagreement between the Lead PSO and the vessel operator would only be discussed after shutdown has occurred; 7. 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 Level B harassment zone for a specified activity, pile driving (e.g., impact and vibratory), drilling, and HRG acoustic sources must shut down immediately, unless shutdown would result in imminent risk of injury or loss of life to an individual, pile refusal, or pile instability, or be delayed if the activity has not commenced. Pile driving, drilling, UXO/MEC detonations, and initiation of HRG acoustic sources must not commence or resume until the animal(s) has been confirmed to have left the Level B harassment zone or the observation time has elapsed with no further sightings; 8. Foundation Installation (i.e., impact and vibratory pile driving, drilling), UXO/MEC detonation, and HRG survey activities shall 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 equipment (i.e., vibratory and impact pile driving, drilling, UXO/MEC detonations, and HRG surveys that use boomers, sparkers, and Compressed High-Intensity Radiated Pulses);	Marine mammals (3.7)	BOEM BSEE NMFS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			9. In the event that a large whale is sighted or acoustically detected that cannot be confirmed as a non-NARW, it must be treated as if it were an NARW; 10. For in-water construction heavy machinery activities other than foundation installation, if a marine mammal is on a path towards or comes within 10 meters of equipment, the applicant must cease operations until the marine mammal has moved more than 10 meters on a path away from the activity to avoid direct interaction with equipment; 11. All vessels must be equipped with a properly installed, operational AIS device and the applicant must report all Maritime Mobile Service Identify numbers to NMFS OPR prior to initiating in-water activities; and 12. Confirmation of all required training must be documented on a training course log sheet and reported to NMFS OPR.		
150.	Construction, Operations, Decommissioning	Vessel strike avoidance measures	1. Prior to the start of the Project's activities involving vessels, all vessel operators and crew must receive a protected species identification training that covers, at a minimum: i. Identification of marine mammals and other protected species known to occur or which have the potential to occur in the applicant's project area; ii. Training on making observations 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); iii. Training on information and resources available to the project personnel regarding the applicability of Federal laws and regulations for protected species; and iv. Training related to vessel strike avoidance measures must be conducted for all vessel operators and crew prior to the start of in-water construction activities. 2. All vessel operators and crews, regardless of their vessel's size, 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; 3. All transiting vessels operating at any speed must have a dedicated visual observer on duty at all times to monitor for marine mammals within a 180 degree direction of the forward path of the vessel (90 degrees port to 90 degree starboards) located at the best vantage point for ensuring vessels are maintaining appropriate separation distances from marine mammals. Visual observers must be equipped with binoculars and alternative monitoring technology 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. Visual observers may be NMFS-approved PSOs or crew members. Observer training related to these vessel strike avoidance measures must be conducted for all vessel operators and crew prior to the start of vessel use; 4. Year-round and when a vessel is in transit, all vessel operators must continuously monitor USCG VHF Channel 16, over which NARW sightings are broadcasted. At the onset of transiting and at least once every 4 hours, vessel operators and/or trained crew members must monitor the project's Situational Awareness System, WhaleAlert, and the Right Whale Sighting Advisory System for the presence of NARWs. Any observations of any large whale by any of the applicant's staff or contractors, including vessel crew, must be communicated immediately to PSOs, PAM operator, and all vessel captains to increase situational awareness. Conversely, any large whale observation or detection via a sighting network (e.g., Mysticetus) by PSOs or PAM operators must be conveyed to vessel operators and crew; 5. Any observations of any large whale by any applicant staff or contractor, including vessel crew, must be communicated immediately to on-duty PSOs, PAM operators, and all vessel captains to increase situational awareness; 6. Nothing in this subpart exempts vessels from applicable speed regulations at 50 CFR 224.105; 7. All vessels must transit active Slow Zones (i.e., DMAs) or acoustically-triggered slow zone), and SMAs at 10 knots or less; 8. All vessels, regardless of vessel size, must immediately reduce speed to 10 knots or less when any large whale, mother/calf pairs, or large assemblages of non-delphinid cetaceans are observed (within 500 meters) of an underway vessel; 9. All vessels, regardless of size, must immediately reduce speed to 10 knots or less when a NARW is sighted, at any distance, by anyone on the vessel; 10. All vessels must comply with NARW approach restrictions at 50 CFR 224.103(c). 11. All vessels must maintain a minimum separation distance of 100 meters from sperm whales and baleen whales other than NARWs. If one of these species is sighted within 100 meters of a transiting vessel, that vessel must shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 100 meters; 12. All vessels must maintain a minimum separation distance of 50 meters 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 meters of a transiting vessel, that 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 meters; 13. When a marine mammal(s) is sighted while a vessel 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, avoid excessive speed or abrupt changes in direction until the animal has left the area). If a marine mammal(s) is sighted within the relevant separation distance, the vessel must shift the engine to neutral and not engage the engine(s) until the animal(s) is outside and on a path away from the separation area. This 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. If a separation distance is triggered, any vessel underway must avoid abrupt changes in course direction and transit at 10 knots or less until the animal is outside the relevant separation distance; and 15. The applicant must submit a North Atlantic right whale Vessel Strike Avoidance Plan 180 days prior to the commencement of vessel use. This plan must describe, at a minimum, how PAM, in combination with visual observations, would be conducted to ensure the transit corridor is clear of right whales and would also provide details on the vessel-based observer.	Marine mammals (3.7)	BOEM BSEE NMFS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
151.	Construction	WTG and ESP foundation installation measures	1. Impact pile driving, vibratory pile driving, and drilling (i.e., foundation installation) must not occur January 1 through April 30; Vibratory pile driving must not occur in May and December. Impact pile driving and drilling must not be planned in December; however, it may occur in the case of unforeseen circumstances and with approval by NMFS; 2. Monopiles must be no larger than 13-meters in diameter. Pin piles must be no larger than 4 meters 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 6,000 kJ for monopile installations and 3,500 kJ for pin pile installation. No more than two monopiles or four pin piles may be installed per day; 3. The applicant must utilize a soft-start protocol for each impact pile driving event of all foundations by performing 4–6 strikes per minute at 10 to 20 percent of the maximum hammer energy, for a minimum of 20 minutes; 4. Soft-start must occur at the beginning of monopile and pin pile impact driving and at any time following a cessation of impact pile driving of 30 minutes or longer; 5. At least four PSOs must be actively observing marine mammals before, during, and after installation of foundation piles (i.e., monopiles and pin piles). At least two PSOs must be stationed and observing on the pile driving vessel and at least two PSOs must be stationed on a secondary, PSO-dedicated vessel. Concurrently, at least one PAM operator must be actively monitoring for marine mammals with PAM before, during, and after impact pile driving; 6. PSOs must visually clear (i.e., confirm no marine mammals are present) the entire minimum visibility zone and the entire clearance zone (when conditions all for visibility of the entire clearance zone) for a full 30 minutes immediately prior to commencing pile driving or drilling; 7. If a marine mammal is detected, visually or acoustically, within or about to enter the applicable clearance zones, prior pile driving or drilling, activities must be delayed 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; i. For piles installed between May 1–May 14 and November 1–December 30, if a NARW is observed or acoustically detected within 10 kilometers of the pile being driven, pile driving must be delayed or stopped (unless activities must proceed for human safety or installation feasibility concerns) and may not resume until the following day or until the animal is confirmed to have exited the zone via aerial or additional vessel surveys; (8) The applicant must deploy dual NASs that are capable of achieving, at a minimum, 10 dB of sound attenuation, during all pile driving and drilling of monopiles and pin piles and comply with the following requirements related noise abatement: ii. A single bubble curtain must not be used unless paired with another noise attenuation device; iii. A big double bubble curtain may be used without being paired with another noise attenuation device; iv. The bubble curtain(s) must distribute air bubbles using an air flow rate of at least 0.5 cubic meter per minute meter. 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 make appropriate adjustments to the air supply and operating pressure such that the maximum possible sound attenuation performance of the bubble curtain(s) is achieved; v. 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; vi. No parts of the ring or other objects may prevent full seafloor contact; vii. Construction contractors must train personnel in the proper balancing of airflow to the ring. Construction contractors must submit an inspection/performance report for approval by the applicant within 72 hours following the performance test. The applicant must then submit that report to NMFS OPR; and viii. Corrections to the bubble ring(s) to meet the performance standards in this paragraph (c)(8) must occur prior to impact pile driving of monopiles and pin piles. If the applicant uses a noise mitigation device in addition to the bubble curtain, the applicant must maintain similar quality control measures as described in this paragraph (c)(8). 8. At least one PAM operator must review data from at least 24 hours prior to pile driving and actively monitor hydrophones for 60 minutes prior to pile driving. All clearance zones must be acoustically confirmed to be free of marine mammals for 60 minutes before activities can begin immediately prior to starting a soft-start of impact pile driving. PAM operators will continue to monitor for marine mammals for at least 30 minutes after pile driving or drilling concludes; 9. For NARWs, 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 confirmed NARW acoustic detections (in addition to visual) have occurred within the PAM clearance zone during the 60-minute monitoring period. Any large whale sighting by a PSO or detected by a PAM operator that cannot be identified by species must be treated as if it were a NARW; 10. If a marine mammal is observed entering or within the respective shutdown zone after pile driving has begun, the PSO must call for a shutdown of pile driving or drilling. The applicant must stop pile driving or drilling 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 pile refusal or pile instability. In any of these situations, the applicant must reduce hammer energy to the lowest level practicable and the reason(s) for not shutting down must be documented and reported to NMFS; 11. If pile driving has been shut down due to the presence of a NARW, pile driving may not restart until the NARW is no longer observed or 30 minutes has elapsed since the last detection; 12. If pile driving has been shut down due to the presence of a marine mammal other than a NARW, 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 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 the applicant must use the lowest hammer energy practicable to maintain stability;	Marine mammals (3.7)	BOEM BSEE NMFS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			13. The applicant must conduct SFV during all foundation installation activities: i. The applicant must conduct SFV during all activities associated with the first three monopile foundations and the first two jacket foundations installed. Subsequent SFV is required should additional piles be driven that are anticipated to produce louder sound fields than those previously measured; ii. The applicant must conduct SFV during drilling the first time it occurs; iii. The applicant must determine source levels, spectra, the ranges to the isopleths corresponding to Level A harassment and Level B harassment thresholds, and transmission loss coefficient(s); iv. The applicant must perform sound field measurements at a minimum of four distances from the pile being driven in one direction (towards deepest waters), including, but not limited to, 750 meters and the modeled Level B harassment zones assuming 10 dB attenuation to verify the accuracy of those modeled zones and contribute to improvement of the models. At least one additional measurement at a different azimuth must be taken to capture sound propagation variability; v. The recordings must be continuous throughout the duration of all pile driving and drilling of each foundation monitored; vi. The 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; vii. The frequency range of the system must cover the range of at least 20 Hz to 20 kHz; viii. The system must be designed to have omnidirectional sensitivity and so that the broadband received level of all pile driving and drilling activities exceeds the system noise floor by at least 10 dB. The dynamic range of the system must be sufficient such that at each location, pile driving signals are not clipped and are not masked by noise floor; ix. If acoustic field measurements collected during installation of foundation piles indicate ranges to the isopleths, corresponding to Level A harassment and Level B harassment thresholds, are greater than the ranges predicted by modeling (assuming 10 dB attenuation), the applicant must implement additional noise mitigation measures prior to installing the next foundation. Additional acoustic measurements must be taken after each modification; x. In the event that field measurements indicate ranges to isopleths, corresponding to Level A harassment and Level B harassment thresholds, are greater than the ranges predicted by modeling (assuming 10 dB attenuation) after implementing additional noise mitigation measures, NMFS OPR may expand the relevant harassment, clearance, and shutdown zones and associated monitoring protocols; xi. If 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), the applicant may request to NMFS OPR a modification of the clearance and shutdown zones. For NMFS OPR to consider a modification request for reduced zone sizes, the applicant must have had to conduct SFV on an additional three foundations and that subsequent foundations would be installed under conditions that are predicted to produce smaller harassment zones than those measured; xii. The applicant must conduct SFV after construction is complete to estimate turbine operational source levels based on measurements in the near and far-field at a minimum of three locations from each foundation monitored. These data must be used to also identify estimated transmission loss rates; and xiii. (xiii) The applicant must submit an SFV plan to NMFS OPR for review and approval at least 180 days prior to planned start of foundation installation activities.		
152.	Construction,	UXO / MEC detonation measures	1. Upon encountering a UXO/MEC, the applicant may only resort to high-order removal (i.e., detonation) if all other means of removal are impracticable and this determination must be documented and submitted to NMFS; 2. UXO/MEC detonations must not occur from December 1 through May 31, annually; however, the applicant may detonate a UXO/MEC in December or May with NMFS' approval on a case-by-case basis; 3. UXO/MEC detonations must only occur during daylight hours; 4. No more than one detonation can occur within a 24-hour period; 5. The applicant must deploy dual NASs during all UXO/MEC detonations and comply with the following requirements related to noise abatement: i. A single bubble curtain must not be used unless paired with another noise attenuation device; ii. A big double bubble curtain may be used without being paired with another noise attenuation device; iii. The bubble curtain(s) must distribute air bubbles using an air flow rate of at least 0.5 cubic meter per minute meter. The bubble curtain(s) must surround 100 percent of the UXO/MEC detonation 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 make appropriate adjustments to the air supply and operating pressure such that the maximum possible sound attenuation performance of the bubble curtain(s) is achieved; iv. 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; v. No parts of the ring or other objects may prevent full seafloor contact; vi. Construction contractors must train personnel in the proper balancing of airflow to the ring. Construction contractors must submit an inspection/performance report for approval by the applicant within 72 hours following the performance test. The applicant must then submit that report to NMFS OPR; and vii. Corrections to the bubble ring(s) to meet the performance standards in this paragraph (d)(5) must occur prior to UXO/MEC detonations. If the applicant uses a noise mitigation device in addition to the bubble curtain, the applicant must maintain similar quality control measures as described in this paragraph (d)(5);	Marine mammals (3.7)	BOEM BSEE NMFS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			6. The applicant must conduct SFV during all UXO/MEC detonations at a minimum of three locations (at two water depths at each location) from each detonation in a direction toward deeper water in accordance with the following requirements: i. The applicant must empirically determine source levels (peak and cumulative sound exposure level), the ranges to the isopleths corresponding to the Level A harassment and Level B harassment thresholds in meters, and the transmission loss coefficient(s). The applicant may estimate ranges to the Level A harassment and Level B harassment isopleths by extrapolating from in situ measurements conducted at several distances from the detonation location monitored; ii. The measurement systems must have a sensitivity appropriate for the expected sound levels from detonations received at the nominal ranges throughout the detonation; iii. The frequency range of the system must cover the range of at least 20 Hz to 20 kHz; and iv. The system will be designed to have omnidirectional sensitivity and will be designed so that the predicted broadband received level of all UXO/MEC detonations exceeds the system noise floor by at least 10 dB. The dynamic range of the system must be sufficient such that at each location, pile driving signals are not clipped and are not masked by noise floor. 7. The applicant must submit an SFV plan to NMFS OPR for review and approval at least 180 days prior to planned start of detonation activities; 8. Applicant must establish and implement clearance zones for UXO/MEC detonation using both visual and acoustic monitoring, as described in the LOA; 9. Applicant must use at least two visual PSOs on a platform (e.g., vessels, plane) and one PAM operator to monitor for marine mammals in the clearance zones prior to detonation. If the clearance zone is larger than 2 kilometers (based on charge weight), applicant must deploy a secondary PSO vessel or aircraft. If the clearance is larger than 5 kilometers (based on charge weight), an aerial survey must be conducted; 10. At least four PSOs must be actively observing marine mammals before and after any UXO/MEC detonation. At least two PSOs must be stationed and observing on a vessel as close as possible to the detonation site and at least two PSOs must be stationed on a secondary, PSO-dedicated vessel or aerial platform. Concurrently, at least one acoustic monitoring PSO (i.e., PAM operator) must be actively monitoring for marine mammals with PAM before, during, and after detonation; 11. At least one PAM operator must review data from at least 24 hours prior to a detonation and actively monitor hydrophones for 60 minutes prior to detonation. All clearance zones must be acoustically confirmed to be free of marine mammals for 60 minutes prior to commencing a detonation. PAM operators will continue to monitor for marine mammals at least 30 minutes after a detonation; 12. All clearance zones must be visually confirmed to be free of marine mammals for 30 minutes before a detonation can occur. All PSOs will also maintain watch for 30 minutes after the detonation event; 13. If a marine mammal is observed entering or within the relevant clearance zone prior to the initiation of a detonation, detonation must be delayed and must not begin until either the marine mammal(s) has voluntarily left the specific clearance zones and have been visually and acoustically confirmed beyond that clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections. The specific time periods are 15 minutes for small odontocetes and 30 minutes for all other marine mammal species; and 14. For NARWs, any visual observation or acoustic detection must trigger a delay to the detonation of a UXO/MEC. Any large whale sighting by a PSO or detected by a PAM operator that cannot be identified by species must be treated as if it were a NARW.		
153.	Construction	HRG survey measures	1. The applicant is required to have at least one PSO on active duty per HRG vessel during HRG surveys that are conducted during daylight hours (i.e., from 30 minutes prior to civil sunrise through 30 minutes following civil sunset) and at least two PSOs on active duty per vessel during HRG surveys that are conducted during nighttime hours; 2. The applicant must deactivate acoustic sources during periods where no data are being collected, except as determined to be necessary for testing. Unnecessary use of the acoustic source(s) is prohibited; 3. The applicant is required to ramp-up SBPs prior to commencing full power, unless the equipment operates on a binary on/off switch, and 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 specified in the LOA; 4. Prior to a ramp-up procedure starting or activating SBPs, the operator must notify the Lead PSO of the planned start time. This notification time must not be less than 60 minutes prior to the planned ramp-up or activation as all relevant PSOs must monitor the clearance zone for 30 minutes prior to the initiation of ramp-up or activation; 5. Prior to starting the survey and after receiving confirmation from the PSOs that the clearance zone is clear of any marine mammals, the applicant must ramp-up sources to half power for 5 minutes and then proceed to full power, unless the source operates on a binary on/off switch in which case ramp-up is not required. 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; 6. The applicant 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; 7. 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 seals, and 30 minutes for all other species; 8. Any large whale sighted by a PSO within 1 kilometer of the SBP that cannot be identified by species must be treated as if it were a NARW and the applicant must apply the mitigation measure applicable to this species; 9. In any case when the clearance process has begun in conditions with good visibility, including via the use of night vision equipment (infrared/thermal camera), and the Lead PSO has determined that the clearance zones are clear of marine mammals, survey operations would be allowed to commence (i.e., no delay is required) despite periods of inclement weather and/or loss of daylight;	Marine mammals (3.7)	BOEM BSEE NMFS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			10. Once the survey has commenced, the applicant must shut down SBPs 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 would be allowed to 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 (e)(10) is detected in the shutdown zone; 11. If SBPs have been shut down due to the presence of a marine mammal, the use of SBPs 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; 12. The applicant must immediately shutdown any SBP 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)(12) is detected in the shutdown zone; 13. If a SBP is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, it would be allowed to be activated again without ramp-up only if: i. PSOs have maintained constant observation; and ii. (ii) No additional detections of any marine mammal occurred within the respective shutdown zones.		
154.	Construction	Fisheries monitoring survey measures	1. All captains and crew conducting fishery surveys must be trained in marine mammal detection and identification. Marine mammal monitoring will be conducted by the trained captain and/or a member of the scientific crew before (within 1 nautical mile and 15 minutes prior to deploying gear), during, and for 15 minutes after haul back; 2. Survey gear will be deployed as soon as possible once the vessel arrives on station; 3. The applicant 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 of the planned location and 15 minutes before gear deployment, then the applicant 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, the applicant and/or its cooperating institutions, contracted vessels, or commercially-hired captains must move again or skip the station; 4. If a marine mammal is deemed to be at risk of interaction after the gear is set, 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 will slow its speed and maneuver the vessel away from the animals to minimize potential interactions with the observed animal; 5. The applicant must maintain visual monitoring effort during the entire period of time that gear is in the water (i.e., throughout gear deployment, fishing, and retrieval); 6. All fisheries monitoring gear must be fully cleaned and repaired (if damaged) before each use; 7. The applicant's fixed gear must comply with the Atlantic Large Whale Take Reduction Plan regulations at 50 CFR 229.32 during fisheries monitoring surveys; 8. Trawl tows will be limited to a 20-minute trawl time at 3.0 knots; 9. All gear, trawl or otherwise, will be emptied immediately after retrieval within the vicinity of the deck; 10. During trawl surveys, vessel crew will open the codend of the trawl net close to the deck in order to avoid injury to animals that may be caught in the gear; 11. During any survey that uses vertical lines, buoy lines will be weighted and will not float at the surface of the water and all groundlines will consist of sinking line. All groundlines must be composed entirely of sinking line. 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; 12. All in-water survey gear will be properly labeled with the scientific permit number or identification as applicant-related research gear. All labels and markings on the buoys and buoy lines will also be compliant with the applicable regulations, and all buoy markings will comply with instructions received by the NOAA GARFO Protected Resources Division; and 13. All survey gear will be removed from the water whenever not in active survey use (i.e., no wet storage). All reasonable efforts, that do not compromise human safety, must be undertaken to recover gear. All lost gear must be reported to NOAA GARFO Protected Resources Division (nmfs.gar.incidental-take@noaa.gov) within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.	Finfish, Invertebrates, Essential Fish Habitat (3.6), Marine mammals (3.7), Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE NMFS
155.	Construction	PSO and PAM operator qualifications	1. The applicant must use independent, dedicated, qualified 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 vessel crew with regard to the presence of protected species and mitigation requirements; 2. 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 shall be submitted to NMFS OPR 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; and the PSO/PAM operator should demonstrate good standing and consistently good performance of PSO/PAM duties;	Marine mammals (3.7)	BOEM BSEE NMFS

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			3. PSOs and PAM operators must successfully complete the required training within the last 5 years, including obtaining a certificate of course completion; 4. 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; 5. All PSOs and PAM operators must be approved by the NMFS OPR. The applicant must submit PSO resumes for NMFS OPR review and approval at least 90 days prior to commencement of in-water construction activities requiring PSOs and PAM operators. Resumes must include dates of training and any prior NMFS OPR approval, as well as dates and description of last experience, and must be accompanied by information documenting successful completion of an acceptable training course. NMFS OPR shall be allowed 3 weeks to approve PSOs from the time that the necessary information is received by NMFS OPR, after which PSOs meeting the minimum requirements will automatically be considered approved; 6. All PSOs must be trained in 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; 7. At least one PSO on active duty for each activity (i.e., foundation installation, UXO/MEC detonation activities, and HRG surveys) must be designated as the "Lead PSO". The Lead PSO must have a minimum of 90 days of at-sea experience working in an offshore environment and is required to have no more than 18 months elapsed since the conclusion of their last at-sea experience; 8. PAM operators must complete specialized training for operating PAM systems and must demonstrate familiarity with the PAM system on which they must be working; and 9. 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 will be tallied cumulatively.		
156.	Construction	General PSO and PAM operator requirements	1. PSOs must monitor for marine mammals prior to, during, and following pile driving, drilling, UXO/MEC detonation activities, and during HRG surveys that use sub-bottom profilers (with specific monitoring durations and needs described in paragraphs (c) through (e) of this section, respectively). 2. PAM operator(s) must acoustically monitor for marine mammals prior to, during, and following all pile driving, drilling, and UXO/MEC detonation activities. 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 available wherever they are stationed) and be in real-time communication with PSOs and transiting vessel captains; 3. All PSOs must be located at the best vantage point(s) on any platform, 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; 4. All on-duty visual PSOs must remain in contact with the on-duty PAM operator, who would monitor the PAM systems for acoustic detections of marine mammals in the area, regarding any animal detection that might be approaching or found within the applicable zones no matter where the PAM operator is stationed (e.g., onshore or on a vessel); 5. During all visual observation periods during the Project, PSOs must use high magnification (25x) binoculars, standard handheld (7x) binoculars, and the naked eye to search continuously for marine mammals. During all pile driving and drilling, at least one PSO on the primary pile driving 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; 6. During all acoustic monitoring periods during the Project, PAM operators must use PAM systems as approved by NMFS; 7. 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; 8. 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; 9. Any PSO or PAM operator has the authority to call for a delay or shutdown of project activities; 10. PSOs must remain in real-time contact with the PAM operators and construction personnel responsible for implementing mitigation (e.g., delay to pile driving or UXO/MEC detonation) 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; and 11. The applicant is required to use available sources of information on NARW presence to aid in monitoring efforts. These include daily monitoring of the Right Whale Sightings Advisory System, consulting of the WhaleAlert app, and monitoring of the Coast Guard's VHF Channel 16 throughout the day to receive notifications of any sightings and information associated with any DMAs, to plan construction activities and vessel routes, if practicable, to minimize the potential for co-occurrence with NARWs.	Marine mammals (3.7)	BOEM BSEE NMFS
157.	Construction	PSO and PAM operator requirements during WTG and ESP	1. If PSOs cannot visually monitor the minimum visibility zone at all times using the equipment described in paragraphs (b)(3) and (4) of this section, pile driving operations must not commence or must shutdown if they are currently active; 2. All PSOs must begin monitoring 60 minutes prior to pile driving, during, and for 30 minutes after the activity. Pile driving must only commence when the minimum visibility zone is fully visible (e.g., not obscured by darkness, rain, fog, etc.) and the clearance zones are clear of marine mammals for at least 30 minutes, as determined by	Marine mammals (3.7)	BOEM BSEE NMFS

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		foundation installation	the Lead PSO, immediately prior to the initiation of pile driving. PAM operators must assist the visual PSOs in monitoring by conducting PAM activities 60 minutes prior to any pile driving, during, and after for 30 minutes for the appropriate size PAM clearance zone (dependent on season). The entire minimum visibility zone must be clear for at least 30 minutes, with no marine mammal detections within the visual or PAM clearance zones prior to the start of pile driving; 3. The applicant must conduct PAM for at least 24 hours immediately prior to pile driving activities; 4. During use of any real-time PAM system, at least one PAM operator must be designated to monitor each system by viewing data or data products that would be streamed in real-time or in near real-time to a computer workstation and monitor; 5. The PAM operator must inform the Lead PSO(s) on duty of animal detections approaching or within applicable ranges of interest to the pile driving activity via the data collection software system (i.e., Mysticetus or similar system) who will be responsible for requesting that the designated crewmember implement the necessary mitigation procedures (i.e., delay or shutdown); and 6. The applicant must prepare and submit a Marine Mammal Monitoring Plan to NMFS OPR for review and approval at least 180 days before the start of any pile driving. The plan must include final pile driving project design (e.g., number and type of piles, hammer type, NASs, anticipated start date, etc.) and all information related to PAM and PSO monitoring protocols for foundation installation activities.		
158.	Construction	PSO requirements during UXO/MEC detonations	1. All on-duty visual PSOs must remain in contact with the on-duty PAM operator, who would monitor the PAM systems for acoustic detections of marine mammals in the area, regarding any animal detection that might be approaching or found within the applicable zones no matter where the PAM operator is stationed (e.g., onshore or on a vessel); 2. If PSOs cannot visually monitor the minimum visibility zone at all times using the equipment described in paragraphs (b)(3) and (4) of this section; UXO/MEC operations must not commence or must shutdown if they are currently active; 3. All PSOs must begin monitoring 60 minutes prior to UXO/MEC detonation, during, and for 30 minutes after the activity. UXO/MEC detonation must only commence when the minimum visibility zone is fully visible (e.g., not obscured by darkness, rain, fog, etc.) and the clearance zones are clear of marine mammals for at least 30 minutes, as determined by the Lead PSO, immediately prior to the initiation of detonation. PAM operators must assist the visual PSOs in monitoring by conducting PAM activities 60 minutes prior to any UXO/MEC detonation, during, and after for 30 minutes for the appropriate size PAM clearance zone. The entire minimum visibility zone must be clear for at least 30 minutes, with no marine mammal detections within the visual or PAM clearance zones prior to the initiation of detonation; 4. For NARWs, any visual or acoustic detection must trigger a delay to the commencement of UXO/MEC detonation. In the event that a large whale is sighted or acoustically detected that cannot be confirmed by species, it must be treated as if it were a NARW; 5. The applicant must conduct PAM for at least 24 hours immediately prior to foundation installation and UXO/MEC detonation activities; 6. During use of any real-time PAM system, at least one PAM operator must be designated to monitor each system by viewing data or data products that would be streamed in real-time or in near real-time to a computer workstation and monitor; 7. The applicant must use a minimum of one PAM operator to actively monitor for marine mammals before, during, and after UXO/MEC detonation. The PAM operator must assist visual PSOs in ensuring full coverage of the clearance and shutdown zones. 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 (i.e., Mysticetus or similar system) who will be responsible for requesting that the designated crewmember implement the necessary mitigation procedures (i.e., delay or shutdown); 8. PAM operators must be on watch for a maximum of 4 consecutive hours, followed by a break of at least 2 hours between watches, and may not exceed a combined watch schedule of more than 12 hours in a single 24-hour period; 9. The applicant must prepare and submit a Marine Mammal Monitoring Plan to NMFS OPR for review and approval at least 180 days before the start of any detonation. The plan must include final UXO/MEC detonation project design (e.g., number and type of UXO/MECs, removal method(s), charge weight(s), anticipated start date, etc.) and all information related to PAM and PSO monitoring protocols for UXO/MEC activities; and 10. A PAM Plan must be submitted to NMFS OPR for review and approval at least 180 days prior to the planned start of foundation installation and prior to the start of any UXO/MEC detonation(s). The authorization to take marine mammals would be contingent upon NMFS OPR approval of the PAM Plan.	Marine mammals (3.7)	BOEM BSEE NMFS
159.	Construction	PSO requirements during HRG surveys	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 activity duty monitoring during HRG surveys conducted at night; 3. PSOs on HRG vessels must begin monitoring 30 minutes prior to activating SBPs during the use of these acoustic sources, and for 30 minutes after use of these acoustic sources has ceased; 4. During daylight hours when survey equipment is not operating, the applicant 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; and 5. Any acoustic monitoring would complement visual monitoring efforts and would cover an area of at least the Level B harassment zone around each acoustic source.	Marine mammals (3.7)	BOEM BSEE NMFS
160.	Construction	Reporting	1. Prior to initiation of in-water project activities, the applicant must demonstrate in a report submitted to NMFS OPR that all required training for the applicant's personnel (including the vessel crews, vessel captains, PSOs, and PAM operators) has been completed; 2. The applicant 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.	Marine mammals (3.7)	BOEM BSEE NMFS

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			3. For all monitoring efforts and marine mammal sightings, the following information must be collected and reported: i. Date and time that monitored activity begins or ends; Construction activities occurring during each observation period; Watch status (i.e., sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform); PSO who sighted the animal; Time of sighting; Weather parameters (e.g., wind speed, percent cloud cover, visibility); 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); Pace of the animal(s); Estimated number of animals (minimum/maximum/high/low/best); Estimated number of animals by cohort (e.g., adults, yearlings, juveniles, calves, group composition, etc.); 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); 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; 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); Activity at time of sighting (e.g., vibratory installation/removal, impact pile driving, construction survey), 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.); Marine mammal occurrence in Level A harassment or Level B harassment zones; 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; and other human activity in the area. 4. If a marine mammal is acoustically detected during PAM monitoring, the following information must be recorded and reported to NMFS OPR: i. Location of hydrophone (latitude & 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 UTC; i.e., Eastern Standard Time time zone is UTC–5); Duration of recordings (start/end dates and times; in 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); 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). 5. Information required for each detection, the following information must be noted: i. 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. 6. The applicant must compile and submit weekly reports to NMFS OPR that document the daily start and stop of all pile driving, UXO/MEC detonations, and HRG survey 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 NAS(s) used and its performance. Weekly reports are due on Wednesday for the previous week (Sunday–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). This weekly report must also identify when, what charge weight size, and where UXO/MECs are detonated (a map must also be provided). Once all foundation pile installation and UXO/MEC detonations are completed, weekly reports are no longer required by the applicant; 7. The applicant must compile and submit monthly reports to NMFS OPR 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 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). This weekly report must also identify when, what charge weight size, and where UXO/MECs are detonated (a map must also be provided). Once foundation installation and UXO/MEC detonations are completed, monthly reports are no longer required; 8. The applicant must submit a draft annual report to NMFS OPR no later than 90 days following the end of a given calendar year. The applicant must provide a final report within 30 days following resolution of comments on the draft report. The draft and final reports must detail the following information: i. 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 and duration of drilling, days and number of UXO/MEC detonations, days and amount of HRG survey effort, etc.); Any PAM systems used; The results, effectiveness, and which NASs were used during relevant activities (i.e., impact and vibratory pile driving, drilling, and UXO/MEC detonations); Summarized information related to situational reporting; Any other important information relevant to the Project, including additional information that may be identified through the adaptive management process; and ii. The final annual report must be prepared and submitted within 30 calendar days following the receipt of any comments from NMFS OPR on the draft report. If no comments are received from NMFS OPR within 60 calendar days of NMFS OPR' receipt of the draft report, the report must be considered final. 9. The applicant must submit its draft 5-year report to NMFS OPR 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 OPR comments on the draft report. If no comments are received from NMFS OPR within 60 calendar days of NMFS OPR receipt of the draft report, the report shall be considered final; 10. The applicant must submit a SFV plan at least 180 days prior to the planned start of vibratory and impact pile driving, drilling, and UXO/MEC detonations. At minimum, the plan must describe how the applicant would ensure that the first three monopile and two jacket (using pin piles) foundation installation sites selected for SFV are		

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			representative of the rest of the monopile and pin pile installation sites. In the case that these sites/scenarios are not determined to be representative of all other monopile/pin pile installation sites, the applicant must include information on how additional sites/scenarios would be selected for SFV. The plan must also include methodology for collecting, analyzing, and preparing SFV data for submission to NMFS OPR. The plan must describe how the effectiveness of the sound attenuation methodology would be evaluated based on the results. The applicant must also provide, as soon as they are available but no later than 48 hours after each installation, the initial results of the SFV measurements to NMFS OPR in an interim report after each monopile for the first three piles, after two jacket foundation using pin piles are installed, and after each UXO/MEC detonation; and i. The SFV plan must also include how operational noise would be monitored. These data must be used to identify estimated transmission loss rates. Operational parameters (e.g., direct drive/gearbox information, turbine rotation rate), characteristics about the UXO/MEC (e.g., charge weight, size, type of charge), as well as sea state conditions and information on nearby anthropogenic activities (e.g., vessels transiting or operating in the area) must be reported; ii. The applicant must provide the initial results of the SFV measurements to NMFS OPR in an interim report after each foundation installation for the first three monopile foundation piles and two jacket foundations (all pin piles), and for each UXO/MEC detonated, as soon as they are available, but no later than 48 hours after each completed installation event and/or detonation. The applicant must also provide interim reports on any subsequent SFV on foundation piles within 48 hours. The interim pile driving SFV report must include hammer energies used during pile driving, SPLpk and median, mean, maximum, and minimum root-mean-square sound pressure level that contains 90 percent of the acoustic energy (SPLrms) and SELss; and iii. The final results of SFV of foundation installations and UXO/MEC detonations must be submitted as soon as possible, but no later than within 90 days following completion of all foundation installation of monopiles and jackets (pin piles) and all necessary detonation events. The final report must include, at minimum, the following: A. SPLpk, root-mean-square sound pressure level that contains 90 percent of the acoustic energy (SPLrms), SELss, integration time for SPLrms, spectrum, and 24-hour cumulative SEL extrapolated from measurements at specified distances (e.g., 750 meters) in mean, median, maximum and minimum levels; B. The SEL and SPL power spectral density and one-third octave band levels (usually calculated as decidecade band levels) at the receiver locations should be reported; The sound levels reported must be in median and linear average (i.e., average in linear space), and in dB; C. 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 COP, at the recording and foundation installation and UXO/MEC detonation locations; D. The extents of the Level A harassment and Level B harassment zone(s); Hammer energies required for pile installation and the number of strikes per pile; and Charge weights and other relevant characteristics of UXO/MEC detonations; E. Hydrophone equipment and methods (i.e., recording device, bandwidth/sampling rate, distance from the monopile/pin pile and/or UXO/MEC where recordings were made; depth of recording device(s)); Description of the SFV PAM 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; and F. Spatial configuration of the noise attenuation device(s) relative to the pile and/or UXO/MEC charge; A description of the NAS and operational parameters (e.g., bubble flow rate, distance deployed from the pile and/or UXO/MEC, etc.) and any action taken to adjust the NAS. 11. The applicant must submit situational reports if the following circumstances occur: i. If a NARW is observed at any time by PSOs or personnel on or in the vicinity of any project vessel, or during vessel transit, the applicant must immediately report sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System (866) 755–6622, through the WhaleAlert app (https://www.whalealert.org/), and to the USCG via channel 16, as soon as feasible but no later than 24 hours after the sighting. Information reported must include, at a minimum: time of sighting, location, and number of NARWs observed; ii. When an observation of a large whale occurs during vessel transit, the following information must be recorded and reported to NMFS OPR: iii. Time, date, and location (latitude/longitude; in Decimal Degrees); The vessel's activity, heading, and speed; Beaufort sea state, water depth (meters), and visibility; Marine mammal identification to the best of the observer's ability (e.g., NARW, whale, dolphin, seal); Initial distance and bearing to marine mammal from vessel and closest point of approach; and Any avoidance measures taken in response to the marine mammal sighting. iv. If a NARW is detected via PAM, the date, time, location (i.e., latitude and longitude of recorder) of the detection as well as the recording platform that had the detection must be reported to nmfs.pacmdata@noaa.gov as soon as feasible, but no longer than 24 hours after the detection. Full detection data and metadata must 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; v. In the event that the personnel involved in the Project discover a stranded, entangled, injured, or dead marine mammal, the applicant must immediately report the observation to the NMFS OPR, the NMFS Greater Atlantic Stranding Coordinator for the New England/Mid-Atlantic area (866–755–6622), and the USCG within 24 hours. If the injury or death was caused by a project activity, the applicant must immediately cease all activities until NMFS OPR 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 OPR may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. The applicant may not resume their activities until notified by NMFS OPR. The report must include the following information: A. (A) Time, date, and location (latitude/longitude; in Decimal Degrees) 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		

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			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.		

AIS = automatic identification system; applicant = Park City Wind LLC; ASR = airport surveillance radar; BO = Biological Opinion; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = Code of Federal Regulations; COP = Construction and Operations Plan; CR = Conservation Recommendation; CZM = Office of Coastal Zone Management; dB = decibel; DMA = dynamic management area; DTS = distributed temperature sensing; EFH = essential fish habitat; EIS = environmental impact statement; EMF = electromagnetic fields; ESA = Endangered Species Act; ESP = electrical service platform; FL = Florida; GARFO = Greater Atlantic Regional Fisheries Office; HAPC = habitat area of particular concern; HDD = horizontal directional drilling; HESD = Habitat and Ecosystem Services Division; HH:MM = hour:minute; HRG = high-resolution geophysical; Hz = hertz; ID = identification; ISO = International Organization for Standardization; ITA = Incidental Take Authorization; ITS = Incidental Take Statement; kHz = kilohertz; kJ = kilojoule; LOA = Letter of Authorization; MassDEP = Massachusetts Department of Environmental Protection; ME = Maine; MEC = munitions and explosives of concern; MMPA = Marine Mammal Protection Act; NA = not applicable; NARW = North Atlantic right whale; NAS = noise attenuation system; NC = North Carolina; NEFOP = Northeast Fisheries Observer Program; NEFSC = Northeast Fisheries Science Center; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; OCS = Outer Continental Shelf; OECC = offshore export cable corridor; OPR = Office of Protected Resources; PAM = passive acoustic monitoring; PATON = private aid to navigation; PSO = protected species observer; RPM = Reasonable and Prudent Measure; SAR = search and rescue; SAV = submerged aquatic vegetation; SBP = subbottom profiler; SEL = sound exposure level; SELss = single strike sound exposure level; SFV = sound field verification; SMA = seasonal management area; SPL = sound pressure level; SPLpk = peak sound pressure level; SPLrms = root-mean-square sound pressure level; SWDA = Southern Wind Development Area; TSHD = trailing suction hopper dredge; USACE = U.S. Army Corps of Engineers; USCG = U.S. Coast Guard; USFWS = U.S. Fish and Wildlife Service; UTC = Universal Time Coordinated; UXO = unexploded ordnance; VA = Virginia; VHF = very high frequency; WTG = wind turbine generator; Y/N = yes/no; YY-MM-DDT = Year-Month-Day Time Zone; YYYY-MM-DD = Year-Month-Day

[a] construction = construction and installation; operations = operations and maintenance; decommissioning = conceptual decommissioning

[b] Unless otherwise specified, BSEE compliance and enforcement to reports should be submitted via TIMSWeb.

[c] NMFS issued CRs to BOEM and USACE for the proposed Project via letter on October 20, 2023. As required by section 305(b)(4)(B) of the Magnuson-Stevens Act, USACE and BOEM will provide a detailed response to these CRs to NMFS regarding which measures will be adopted, partially adopted, or not adopted along with a rationale. At the time of Final EIS issuance, BOEM and USACE have yet not determined which CRs each agency intends to adopt or partially adopt. As such, the full list of CRs received from NMFS is included in this document.

[d] The mitigation, monitoring, and reporting measures from the MMPA proposed rule listed here may be different from those listed in NMFS' final rule, once issued.

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H.1 References

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