# Appendix G

## Mitigation and Monitoring*

*with June 2024 Errata Incorporated

# Appendix G: Mitigation and Monitoring

This Final EIS assesses the potential physical, biological, socioeconomic, and cultural impacts that could result from the construction and installation, O&M, and conceptual decommissioning of the Atlantic Shores South Project proposed by Atlantic Shores in its COP.

As part of the Project, Atlantic Shores has committed to implement applicant-proposed EPMs to avoid, reduce, otherwise mitigate, or monitor impacts on the resources discussed in Chapter 3, *Affected Environment and Environmental Consequences*, of this Final EIS. These EPMs, described in Table G-1, are part of the Proposed Action, and implementation of EPMs is considered in the impact analysis for the Proposed Action and each action alternative. BOEM considers as part of the Proposed Action only those measures that Atlantic Shores has committed to in the COP (Atlantic Shores 2024).

BOEM may select alternatives and require additional mitigation or monitoring measures to further protect and monitor these resources. These additional mitigation and monitoring measures, shown in Table G-2, may result from reviews under several environmental statutes (CAA, ESA, MSA, MMPA, and NHPA) as discussed in Appendix A, *Required Environmental Permits and Consultations*, of this Final EIS. Please note that not all of these mitigation measures are within BOEM's statutory and regulatory authority but could be adopted and imposed by other government entities. Other measures identified during development of this EIS are listed in Table G-3, and Table G-4 identifies measures that may be required by authorizations and permits issued to the lessee.

If BOEM decides to approve the COP, the ROD will state which of the mitigation and monitoring measures identified by BOEM in Table G-2 have been adopted and, if not, why they were not. The ROD will describe the specific terms and conditions of these measures for which compliance is required (40 CFR 1505.3). Atlantic Shores will be required to certify compliance with these terms and conditions under 30 CFR 285.633(a). Furthermore, pursuant to 30 CFR 585.634(b), BOEM will periodically review the activities conducted under the approved COP with the frequency and extent of the review based on the significance of any changes in available information and on onshore or offshore conditions affecting, or affected by, the activities conducted under the COP.

Monitoring may be required to evaluate the effectiveness of mitigation measures or to identify if resources are responding as predicted to impacts from the Proposed Action. This monitoring would typically be developed in coordination among BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to (1) alter how a mitigation measure identified in the COP or ROD is being implemented, (2) revise or develop new mitigation or monitoring measures for which compliance would be required under the Atlantic Shores South COP in accordance with 30 CFR 285.633(a), (3) develop measures for future projects, or (4) contribute to regional efforts for better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g., potential cumulative impact assessment tool). Unless specified as an EPM, the proposed mitigation measures described below would not change the impact ratings on the affected resource, as described in Chapter 3 of this Final EIS, but would further reduce expected impacts or inform the development of additional mitigation measures if required.

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**Table G-1. Applicant-proposed environmental protection measures**

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
|---|---|---|---|
| GEO-01 | Use shortest feasible offshore cable route to minimize seafloor disturbance. | Geology and Multiple | N/A – best practice |
| GEO-02 | Utilize, to the maximum extent practicable, dynamic positioning vessels and jet plow embedment to minimize sediment disturbance and alteration during the offshore cable installation process. | Geology and Multiple | N/A – best practice |
| GEO-03 | Use anchor midline buoys on anchored construction vessels, where feasible, to minimize disturbance to the seafloor and sediments. | Geology and Multiple | N/A – best practice |
| GEO-04 | Avoid known natural and anthropogenic hazards including three proximal mapped ocean disposal areas, shipwrecks and MEC, to the maximum extent practicable. | Geology and Multiple | N/A – best practice |
| GEO-05 | Export cable corridor routes will avoid most federal- and state-designated sand resources areas and sand borrow sites. | Geology and Multiple | N/A – best practice |
| GEO-06 | Survey any cable crossing in accordance with applicable industry standards and practices both before and after each cable crossing. | Geology and Multiple | N/A – best practice |
| GEO-07 | Bury offshore cables to a target depth of 5 to 6.6 feet (1.5 to 2 meters) to avoid interference with existing marine uses (e.g., anchoring and commercial fishing) and protect the cable. | Geology and Multiple | BOEM and BSEE |
| GEO-08 | Manage the Project by a comprehensive OSRP to minimize risk of sediment contamination (COP Volume I, Appendix I-D; Atlantic Shores 2024). | Geology and Multiple | BSEE, USCG, USEPA, and NJDEP |
| GEO-09 | Perform cable surveys at regular intervals to identify any issues associated with potential scour and depth of burial. | Geology and Multiple | BOEM and BSEE |
| GEO-10 | Conduct a Phase I Environmental Site Assessment prior to ground-disturbing activities to assess the presence or absence of pre-existing contamination in the construction footprint. | Geology and Multiple | USEPA and NJDEP |
| GEO-11 | Conduct onshore geotechnical borings as needed. | Geology and Multiple | N/A – best practice |
| GEO-12 | Site onshore interconnection cable routes to travel primarily along previously disturbed areas such as existing roadways, utility rights-of-way (ROWs), and/or bike paths. | Geology and Multiple | N/A – best practice |
| GEO-13 | Use HDD at landfall sites and install at depths designed to prevent exposure of the cable due to beach and nearshore erosion. | Geology and Multiple | N/A – best practice |
| GEO-14 | Prepare a dust control plan to control fugitive dust during construction, in compliance with applicable dust control standards in NJDOT's Soil Erosion and Sedimentation Control Standards. | Geology and Multiple | NJDOT |
| GEO-15 | Use trenchless techniques to minimize soil disturbance in select locations such as wetlands, waterbodies, or busy roadways. | Geology and Multiple | N/A – best practice |
| GEO-16 | Develop a Spill Prevention, Control, and Countermeasure (SPCC) Plan and maintain for the life of the Project. | Geology and Multiple | BSEE, USCG, USEPA, and NJDEP |
| GEO-17 | Employ BMPs to properly contain excavated soils and sediments and stabilize disturbed land areas, to avoid erosion and sediment runoff into nearby resource areas. | Geology and Multiple | N/A – best practice |
| GEO-18 | Implement BMPs, including pre-construction installation of appropriate erosion and siltation control measures, such as siltation fencing, near water bodies, around catch basins, and around temporary stockpiles. | Geology and Multiple | N/A – best practice |
| GEO-19 | Implement BMPs, including regular monitoring of disturbed areas and existing drainage areas, and monitoring of these areas immediately after precipitation events and adjustment of measures as needed. | Geology and Multiple | N/A – best practice |
| GEO-20 | Implement BMPs, including stabilization, through seeding or repaving of disturbed areas as appropriate, as soon as possible following installation activities. | Geology and Multiple | N/A – best practice |
| GEO-21 | Implement BMPs, including development of a Stormwater Management Plan, including erosion and sedimentation control measures. | Geology and Multiple | N/A – best practice |
| GEO-22 | Cable burial near Federal Aids to Navigation must be deconflicted with USCG prior to installation. | Geology and Multiple | USCG |
| GEO-23 | Conduct vibration monitoring at the Atlantic Landfall Site during HDD activities to minimize impacts to the existing outfall pipe at the proposed location. | Geology and Multiple | N/A – best practice |
| GEO-24 | Institute an offset around the existing outfall pipe at the proposed Atlantic Landfall Site. | Geology and Multiple | N/A – best practice |
| GEO-25 | Establish a hotline and contact information, including email, phone number, and a defined protocol for cable maintenance and management. This hotline will be the appropriate resource for contact prior to renourishment project actions and should be the contact in the case of an exposed cable. | Geology and Multiple | N/A – best practice |
| GEO-26 | Work with impacted communities to identify infrastructure such as bridges, businesses, homes, drainage structures, or other sites of significance that vibration monitoring is required. | Geology and Multiple | N/A – best practice |

[1]The Joint BOEM/BSEE Direct Final Rule: Reorganization of Title 30 – Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf, 88 FR 6376, effective January 31, 2023 (https://www.federalregister.gov/d/2023-00871) transfers enforcement authorities from BOEM to BSEE.

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
|---|---|---|---|
| GEO-27 | Atlantic Shores will implement the following measure in accordance with the OREC allowance that BPU awarded to Atlantic Shores on June 30, 2021:<br>• Maintain and update the Environmental Protection Plan and Fisheries Protection Plan at key Project milestones, including commencement of construction, completion of construction, and every 2 years thereafter, through decommissioning, or at other times as requested by NJDEP. | Geology and Multiple | BPU |
| GEO-28 | Atlantic Shores will implement the following measure in accordance with the OREC allowance that BPU awarded to Atlantic Shores on June 30, 2021:<br>• Update the Environmental Protection Plan and Fisheries Protection Plan to ensure New Jersey's natural resources, including finfish and shellfish, sea turtles, marine mammals, avian species, bats and benthic populations are protected throughout the life of the Project from pre-construction through decommissioning and to ensure that any impacts are being actively monitored and mitigated as required by law. | Geology and Multiple | BPU |
| GEO-29 | Atlantic Shores will implement the following measure in accordance with the OREC allowance that BPU awarded to Atlantic Shores on June 30, 2021:<br>• Provide funding to the State of New Jersey for research initiatives and the regional monitoring of wildlife and fisheries related to the introduction of offshore wind projects. The funding will be administered by the NJDEP and BPU, with stakeholder input to aid in the identification and prioritization of regional research and monitoring needs. | Geology and Multiple | BPU and NJDEP |
| GEO-30 | Atlantic Shores will implement the following measure in accordance with the OREC allowance that BPU awarded to Atlantic Shores on June 30, 2021:<br>• Report annually in writing to BPU and NJDEP beginning June 30, 2022, on actions taken to ensure environmental protection, fisheries protection, mitigation of environmental and/or fishing impacts. This report will specifically address how Atlantic Shores is enacting its plans for environmental and fisheries protection and mitigation of impacts as articulated in its Application to BPU. An appendix to the report will indicate the data collected in the reporting period, and will include an accessibly-written, narrative description(s) of the dataset(s), the associated findings made based upon these data, and reference(s) to the data portal(s) where these data can be publicly accessed. This appendix will be made public. | Geology and Multiple | BPU and NJDEP |
| GEO-31 | Atlantic Shores will implement the following measure in accordance with the OREC allowance that BPU awarded to Atlantic Shores on June 30, 2021:<br>• Report annually in writing to BPU and NJDEP beginning June 30, 2022, on the policies and programs that may be adopted by BPU or NJDEP to help reduce future environmental or fisheries impacts or enhance the protection of natural resources. This report will detail any proposed future mitigation or protection measures that could be adopted, providing a description, proposed timeline, and expected outcomes of the recommended action. | Geology and Multiple | BPU and NJDEP |
| GEO-32 | Atlantic Shores will implement the following measure in accordance with the OREC allowance that BPU awarded to Atlantic Shores on June 30, 2021:<br>• Make public through appropriate data portals, all data collected in the development of the Project from pre-construction activities through decommissioning activities. All collected information and scientific data not deemed confidential by statute or regulation will be made publicly available. Specifically, data with particular emphasis on natural resources including, but not limited to, finfish and shellfish, sea turtles, marine mammals, avian species, bat and benthic populations, as well as data regarding vessel strikes, avoidance, observations on habitat, and routine data collection on ocean conditions will be shared in a manner that is in keeping with best practices for the reporting of these types of data. Atlantic Shores will report annually to BPU and NJDEP beginning June 30, 2022, describing the type of data shared, and where the data is shared. Should a common database for New Jersey-related, scientific data generated in association with offshore wind development be created, Atlantic Shores will archive all data collected with the development of the Project in that data repositor. | Geology and Multiple | BPU and NJDEP |
| OCE-01 | Conduct offshore data collection using metocean buoys and share with the public via https://ioos.noaa.gov/regions/maracoos and https://www.atlanticshoreswind.com/mariners/. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-02 | Design Project to consider site-specific metocean conditions. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-03 | Ensure that WTG technology and the construction schedule consider both extreme weather and environmental conditions. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-04 | Establish safe weather limits for all installation and maintenance activities, including shutdown during extreme weather. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-05 | In the export cable design, include a monitoring system, such as a distributed temperature system, distributed acoustic sensing system, or online partial discharge monitoring to continuously assess the status of offshore cables and detect anomalous conditions, insufficient or excess cable depth, or potential cable damage. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-06 | Employ HDD at the landfall sites to ensure sufficient burial of the cables along the beachfront, which is subject to erosion and coastal flooding. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-07 | Encase buried onshore cables in a concrete duct bank, which protects from the effects of storm surge and coastal flooding. | Oceanography and Meteorology – Multiple | N/A – best practice |
| OCE-08 | Install onshore interconnection cables underground primarily along existing roadways, or utility ROWs, and/or along bike paths. | Oceanography and Meteorology – Multiple | N/A – best practice |

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
|---|---|---|---|
| AQ-01 | Use engines manufactured and installed to meet or exceed emission control requirements. Engine manufacturers will incorporate pollution control measures into their designs. Techniques used could include: ensuring complete combustion in the engines, by control of the combustion air, controlling fuel flow, ensuring complete mixing, and staging combustion; avoiding hot spots in the combustion process that can form $NO_X$ by staging combustion, injecting water, recirculating flue gas, and otherwise cooling the system; and using post-combustion controls to remove air pollutants after they have formed, by adding particulate filters, oxidation catalysts, and selective catalytic reduction systems. | Air Quality | N/A – best practice |
| AQ-02 | Vessel engines will use a combination of combustion and post-combustion controls to meet or exceed applicable marine engine standards, including: The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI (for foreign vessels); 40 CFR Part 1039 (for Tier 1 and 2 domestic marine diesel engines smaller than 37 kW); Control of Emissions from Marine Compression-Ignition Engines; 40 CFR Part 1042 (for Tier 1 and 2 domestic marine diesel engines larger than 37 kW); and Control of Emissions from New and In-Use Marine Compression-Ignition Engines and Vessels, 40 CFR Part 1042 (for Tier 3 and 4 domestic marine diesel engines). On-road engines, nonroad engines, and aircraft engines will meet or exceed similar standards. | Air Quality | N/A – best practice |
| AQ-03 | The best engines available for the task will be used. Construction vessels will be supplied by contractors for temporary use on the Project. For routine O&M, Atlantic Shores will have additional ability to specify the vessel(s) used, through long-term contracting or outright purchase. Atlantic Shores is actively evaluating opportunities to use liquefied natural gas or hydrogen as the primary fuel for the main CTVs or service operations vessel (SOV) to be used for routine O&M. Regardless of whether these technologies are practicable, the primary CTV or SOV to be used for O&M will likely be newly built and will meet top-Tier USEPA marine engine standards for new construction. Nonroad engine emissions will be minimized using engines compliant with 40 CFR 1039, Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines, i.e., "Tier 4" engines, where practicable. | Air Quality | N/A – best practice |
| AQ-04 | Clean fuels will be used to the maximum extent practicable. Marine diesel fuel will comply with the fuel sulfur limit of 15 ppm per 40 CFR 80, which is the same limit as onshore ULSD. For heavier residual fuel oils used in Category 2 and Category 3 engines, and for engines on foreign vessels, the Project will comply with the fuel oil sulfur content limit of 1,000 ppm set in MARPOL VI and corresponding USEPA regulations. Nonroad engines will use ULSD. The use of clean fuels will minimize emissions from fuel impurities and allow for cleaner combustion. | Air Quality | N/A – best practice |
| AQ-05 | Implement BMPs and investigate the use of innovative tools and/or technologies to minimize air emissions from vessel operations. Specifically, Atlantic Shores will optimize construction and O&M activities to minimize vessel operating times and loads. This will include weather monitoring, forecasting, and Project tracking to minimize emissions resulting from non-productive time, and incentives for contractor fuel savings. Onshore construction mitigation will also include the development of dust-control plans for onshore construction areas to minimize effects from fugitive dust resulting from construction activities. | Air Quality | N/A – best practice |
| AQ-06 | Air permit requirements will be met or exceeded, and Atlantic Shores will comply with all applicable air quality regulatory requirements. A key element will be obtaining the OCS air permit. Atlantic Shores will comply with other air-related regulatory requirements by using engines manufactured and maintained in compliance with the appropriate standards, which include New Source Performance Standards, National Emissions Standards for Hazardous Air Pollutants, and federal standards for nonroad and marine diesel engines. If onshore stationary equipment triggers any requirement to obtain a New Jersey air permit (including obtaining coverage under a general permit), Atlantic Shores will obtain the required permit. | Air Quality | USEPA and NJDEP |
| AQ-07 | Any required OCS air permit will address documentation of compliance with ambient air standards, documentation of no adverse impact on air quality related values at Class I Areas, control technology review, and emission offsets. | Air Quality | USEPA and NJDEP |
| WAT-01 | Anchor midline buoys will be used on anchored construction vessels, where feasible, to minimize disturbance to the seafloor and sediments. | Water Quality | N/A – best practice |
| WAT-02 | Dynamically positioned vessels and jet plow embedment will be used to the maximum extent practicable to minimize sediment disturbance and alteration during cable laying process. | Water Quality | N/A – best practice |
| WAT-03 | Accidental spill or release of oils or other hazardous materials will be managed through the OSRP that meets USCG and BSEE requirements. | Water Quality | BSEE, USCG, USEPA, and NJDEP |
| WAT-04 | HDD will be used to install the export cable to the landfall sites. All HDD activities will be managed by an HDD Contingency Plan for the Inadvertent Release of Drilling Fluid to ensure the protection of marine and inland surface waters from an accidental release of drilling fluid. All drilling fluids will be collected and recycled upon HDD completion. | Water Quality | N/A – best practice |
| WAT-05 | Vessels will operate in compliance with regulatory requirements related to the prevention and control of discharged and accidental spills. | Water Quality | BSEE, USCG, USEPA, and NJDEP |
| WAT-06 | Project facilities have been sited/routed in previously disturbed areas and along existing ROWs. | Water Quality | N/A – best practice |
| WAT-07 | The Project facilities will avoid public water supplies/wellhead protection areas to the maximum extent practicable. | Water Quality | N/A – best practice |
| WAT-08 | Trenchless cable installation methods (e.g., jack-and-bore, HDD) will be used to avoid impacts on wetlands and waterbodies. HDD will be used to install the export cable to the landfall sites. All HDD activities will be managed by an HDD Contingency Plan for the Inadvertent Releases of Drilling Fluid to minimize the potential effects from an accidental release of drilling fluid on marine and inland surface waters. All drilling fluids will be collected and recycled upon HDD completion. | Water Quality | N/A – best practice |

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
|---|---|---|---|
| WAT-09 | BMPs such as silt fence, filter socks, inlet protection, dust abatement and other approved BMPs will be implemented in accordance with the approved Soil Erosion and Sediment Control Plan to properly contain excavated soils and sediments and stabilize disturbed land areas, to avoid erosion and sediment runoff into waterbodies and impacts on water quality. Additionally, the Project will be constructed in accordance with an approved New Jersey Division of Land Resource Protection Stormwater Management Control Plan (NJPDES and SWPPP) and County Soil Conservation District BMPs to avoid and minimize Project-related water quality impacts on nearby aquatic habitats. | Water Quality | BSEE, USCG, USEPA, and NJDEP |
| WAT-10 | Temporarily disturbed areas will be stabilized through seeding or repaving as appropriate and in accordance with the approved Soil Erosion and Sediment Control Plan. | Water Quality | BSEE, USCG, USEPA, and NJDEP |
| WAT-11 | A NJPDES and a SPCC plan will be implemented. | Water Quality | BSEE, USCG, USEPA, and NJDEP |
| WAT-12 | Environmental/Construction Monitor(s) will be assigned to ensure compliance with applicable permit conditions and that BMPs are functional. | Water Quality | N/A – best practice |
| WAT-13 | The Project facilities will avoid stormwater outfalls and water intake structures that are identified during constructability studies, stakeholder consultation, and pre-construction surveys to the maximum extent practicable. Atlantic Shores will adhere to any buffers or offsets in accordance with state or local requirements to conduct work near these outfalls or structures. | Water Quality | BSEE, USCG, USEPA, and NJDEP |
| WET-01 | Site/route Project facilities in previously disturbed areas and along existing ROWs. | Wetlands and Waterbodies | N/A – best practice |
| WET-02 | Install onshore interconnection cables underground and use trenchless installation such as jack-and-bore, pipe jacking, and/or HDD, where feasible, to avoid direct impacts on wetlands and waterbodies. | Wetlands and Waterbodies | N/A – best practice |
| WET-03 | Implement BMPs such as silt fence, filter socks, inlet protection, dust abatement and other approved BMPs in accordance with the approved Soil Erosion and Sediment Control Plan to properly contain excavated soils and sediments and stabilize disturbed land areas, to avoid erosion and sediment runoff into wetlands and waterbodies. Additionally, the Project will be constructed according to an approved New Jersey Division of Land Resource Protection Stormwater Management Control Plan (NJPDES and SWPPP) to avoid and minimize Project-related effects on nearby aquatic habitats. | Wetlands and Waterbodies | BSEE, USCG, USEPA, and NJDEP |
| WET-04 | Return temporarily disturbed areas to pre-construction conditions and ensure that all onshore substation areas are graded, grassed, graveled, or paved to prevent future erosion. | Wetlands and Waterbodies | N/A – best practice |
| WET-05 | Environmental/Construction Monitor(s) to comply with applicable plans and permit conditions, and to ensure that BMPs are functional. | Wetlands and Waterbodies | N/A – best practice |
| COA-01 | Site Project facilities and work areas/construction in previously disturbed areas and along existing ROWs to avoid sensitive habitats (e.g., wetlands, waterbodies, forest) to the maximum extent practicable. | Coastal Habitat and Fauna | N/A – best practice |
| COA-02 | Avoid removing mature trees, remove only the minimum necessary, and do so during the winter months to minimize potential impacts on wildlife species. | Coastal Habitat and Fauna | USFWS and NJDEP |
| COA-03 | Install onshore interconnection cables underground and use trenchless installation methods such as jack-and-bore, jack piping, and HDD, where there are wetlands, waterbodies, and other sensitive habitats, particularly threatened and endangered species habitats, such as the dune and beach habitat east of the Monmouth Landfall Site. | Coastal Habitat and Fauna | USFWS and NJDEP |
| COA-04 | Implement lower dB construction equipment (e.g., smaller backhoes) when feasible. | Coastal Habitat and Fauna | N/A – best practice |
| COA-05 | Conduct construction during permitted hours, to the maximum extent practicable, when ambient noise levels are highest. | Coastal Habitat and Fauna | N/A – best practice |
| COA-06 | Time of year restrictions for construction will be followed, as required, through permitting and resource agency consultation (USFWS and NJDEP). | Coastal Habitat and Fauna | USFWS and NJDEP |
| COA-07 | IA-certified Soil Erosion and Sediment Control Plan from the appropriate County Conservation District and approved New Jersey Division of Land Resource Protection NJPDES permit will be implemented that includes a SWPPP to avoid and minimize Project-related water quality impacts on nearby aquatic habitats. | Coastal Habitat and Fauna | NJDEP |
| COA-08 | Implement conservation measures during the construction and O&M phases to accommodate species-specific monarch butterfly *(Danaus plexippus)* habitat requirements per USFWS request. The following measures will be implemented as necessary:<br>• For any areas where vegetation disturbance will occur, whether during Project construction or related to post-construction O&M activities, survey the affected area for milkweed (*Asclepias* spp.) before the start of work. Atlantic Shores will avoid clearing milkweed from May 15 through September 30 when monarch caterpillars may be present.<br>• Develop a Revegetation Plan to enhance monarch butterfly habitat for areas of temporary disturbance and incidental to other Project activities. Consult the New Jersey Monarch Butterfly Conservation Guide in developing the plan and submit the plan for USFWS review.<br>• Atlantic Shores will not use herbicide for ROW maintenance and in other portions of the Project where milkweed is likely to occur.<br>• Atlantic Shores will follow NJDEP requirements with regards to soil disturbance including the use of only native milkweeds when revegetating disturbed areas. | Coastal Habitat and Fauna | USFWS and NJDEP |
| COA-09 | Restore temporarily disturbed areas in accordance with NJDEP and local permitting requirements. | Coastal Habitat and Fauna | NJDEP |
| COA-10 | Assign Environmental/Construction Monitor(s) to ensure compliance with applicable permit conditions and that BMPs are functional. | Coastal Habitat and Fauna | N/A – best practice |

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|---|---|---|---|
| BIR-01 | An Avian and Bat Survey Plan has been implemented in conjunction with BOEM and USFWS that included digital aerial surveys and a satellite telemetry study of the federally protected red knot to further characterize the WTA and support consultations. | Birds | BOEM, BSEE, and USFWS |
| BIR-02 | Two Motus receiving antennas have been installed on separate metocean buoys to track the offshore movement of tagged bird species within the WTA. | Birds | BOEM, BSEE, and USFWS |
| BIR-03 | Limit lighting during offshore operations to the minimum required by regulation and for safety, minimizing the potential for any light driven attraction of birds. | Birds | BOEM, BSEE, and USFWS |
| BIR-04 | Reduce attraction to structures by using perch deterrents to the maximum extent practicable for offshore structures. | Birds | BOEM, BSEE, and USFWS |
| BIR-05 | Use red flashing FAA lights and yellow flashing marine navigation lights on the WTGs, instead of constant white light, to reduce further bird attraction, and consider Aircraft Detection Lighting System (ADLS) to significantly reduce the number of hours FAA lighting will be illuminated. | Birds | USCG |
| BIR-06 | Use down-lighting and down-shielding to the maximum extent practicable. | Birds | N/A – best practice |
| BIR-07 | Marine debris caught on Offshore Project structures will be removed, when safe and practicable, to reduce the risk of bird entanglement. | Birds | BOEM, BSEE, and NMFS |
| BIR-08 | Develop and implement an avian post-construction monitoring plan for the offshore area. | Birds | BOEM, BSEE, and USFWS |
| BIR-09 | Report any dead or injured birds to BOEM on an annual basis. Birds with USFWS bands will be reported to the USGS Bird Banding Lab. | Birds | BOEM, BSEE, and USFWS |
| BIR-10 | Bury onshore cables, thus avoiding collision risk to birds associated with overhead structures and conductors. | Birds | N/A – best practice |
| BIR-11 | HDD at the landfall site and trenchless cable installation techniques for wetland crossings will be used to avoid impacts on wetlands and shoreline habitats, including any potential shoreline nesting areas, such as those for the Federally listed threatened piping plover and red knot. | Birds | N/A – best practice |
| BIR-12 | Minimize tree clearing to the maximum extent practicable. This limited tree clearing will be the minimum required to install facility components, will not include mature trees, and will be conducted in the winter months. | Birds | USFWS and NJDEP |
| BIR-13 | Onshore construction lighting will be temporary and localized to the work area. | Birds | N/A – best practice |
| BIR-14 | Limit lighting during onshore operations to the minimum required by regulation and for safety, minimizing the potential for any light driven attraction of birds. | Birds | N/A – best practice |
| BIR-15 | The communication antenna will be designed in accordance with USFWS guidelines, to the extent practicable, including lighting and support system characteristics. | Birds | N/A – best practice |
| BIR-16 | A Bird and Bat Monitoring Plan (BBMP) will be developed and implemented prior to the commencement of offshore construction in coordination with USFWS and other relevant regulatory agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring. | Birds | USFWS |
| BAT-01 | Two years of pre-construction vessel-based acoustic surveys for bats has been implemented to build upon and fill knowledge gaps from previous survey efforts. | Bats | BOEM, BSEE, and USFWS |
| BAT-02 | Limit lighting during offshore O&M to the minimum required by regulation and for safety, minimizing the potential for any light driven attraction of bats or their insect prey and therefore reducing the effects of light on potential collisions of bats at night. | Bats | N/A – best practice |
| BAT-03 | Red flashing FAA lights and yellow flashing marine navigation lights will be used on the WTGs instead of constant white light, which has been shown to reduce eastern red bat fatality rates, the most prevalent species observed offshore. Furthermore, ADLS is being considered to significantly reduce the number hours FAA lighting will be illuminated. | Bats | USCG |
| BAT-04 | Use down-lighting and down-shielding to the maximum extent practicable. | Bats | N/A – best practice |
| BAT-05 | Develop and implement a post-construction bat monitoring plan for the offshore area. | Bats | BOEM, BSEE, and USFWS |
| BAT-06 | Site onshore facilities to avoid bat habitat to the maximum extent practicable. | Bats | N/A – best practice |
| BAT-07 | Minimize tree clearing to the maximum extent practicable. While no tree clearing is anticipated to occur during the O&M phase of the Project, Atlantic Shores will coordinate with USFWS in the event that significant tree clearing should be required. | Bats | N/A – best practice |
| BAT-08 | No known northern long-eared bat or tricolored bat maternity or roost trees are present in the Onshore Project area; however, to avoid potential conflicts, any tree removal activities will take place outside of the "active season" for northern long-eared bats and tricolored bats, which is defined as April 1 to September 30. | Bats | BOEM, BSEE, and USFWS |
| BAT-09 | Onshore construction lighting will be temporary and localized to the work area. | Bats | N/A – best practice |
| BAT-10 | Limit lighting during onshore O&M to the minimum required by regulation and for safety, minimizing the potential for any light driven attraction or deterrence of bats affecting their foraging behavior and exposure to predation and collisions. | Bats | N/A – best practice |
| BAT-11 | Reasonable efforts will be made to minimize onshore construction noise. | Bats | N/A – best practice |
| BAT-12 | Onshore work at night will be minimized to the maximum extent practicable. | Bats | N/A – best practice |

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
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| BAT-13 | A BBMP will be developed and implemented prior to the commencement of offshore construction in coordination with USFWS and other relevant regulatory agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring. | Bats | USFWS |
| BAT-14 | The communication antenna will be designed in accordance with USFWS guidelines, to the extent practicable, including lighting and support system characteristics. | Bats | N/A – best practice |
| BEN-01 | Comprehensive benthic habitat surveys (seafloor sampling, imaging, and mapping) have been conducted in coordination with BOEM and NOAA to support the identification of sensitive and complex habitat and the development of strategies for minimizing impacts to identify areas to the maximum extent practicable. | Benthic | BOEM, NMFS, and BSEE |
| BEN-02 | Use HDD to avoid seabed disturbance impacts on benthic habitat at the landfall sites. All HDD activities will be managed by an HDD Contingency Plan for the Inadvertent Releases of Drilling Fluid to ensure the protection of marine and inland surface waters from an accidental release of drilling fluid. All drilling fluids will be collected and recycled upon HDD completion. | Benthic | N/A – best practice |
| BEN-03 | Bury interarray, interlink, and export cables to a target depth of 5 to 6.6 feet (1.5 to 2 meters), which will allow the benthic community to recover and recolonize, avoiding direct interaction with benthic invertebrates, and minimize impacts from electromagnetic fields (EMFs). | Benthic | N/A – best practice |
| BEN-04 | Use dynamically positioned vessels and jet plow embedment to the maximum extent practicable to reduce sediment disturbance during cable laying process. | Benthic | N/A – best practice |
| BEN-05 | Operate vessels in compliance with regulatory requirements related to the prevention and control of discharges and accidental spills. | Benthic | BOEM and BSEE |
| BEN-06 | Manage accidental spills or release of oils or other hazardous materials through the OSRP. | Benthic | BSEE, USCG, USEPA, and NJDEP |
| BEN-07 | Employ an anchoring plan for areas where anchoring is required to avoid impacts on sensitive habitats, to the maximum extent practicable, including hard bottom and structurally complex habitats, identified through the interpretation of completed site-specific high resolution geophysical (HRG) and benthic assessments. | Benthic | BOEM, BSEE, and NMFS |
| BEN-08 | Implement a benthic habitat monitoring plan to measure and assess the disturbance and recovery of marine benthic habitats and communities because of Project construction and operation. | Benthic | BOEM, BSEE, and NMFS |
| FIN-01 | Comprehensive benthic habitat surveys (seafloor sampling, imaging, and mapping) have been conducted in consultation with BOEM and NOAA to support the identification of sensitive and complex habitats and the development of strategies for minimizing impacts on identified areas to the maximum extent practicable. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| FIN-02 | Use HDD to avoid seabed disturbance impacts on benthic habitat at the landfall sites. All HDD activities will be managed by an HDD Contingency Plan for the Inadvertent Releases of Drilling Fluid to ensure the protection of marine and inland surface waters from an accidental release of drilling fluid. All drilling fluids will be collected and recycled upon HDD completion. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| FIN-03 | Bury interarray, interlink, and export cables to a target depth of 5 to 6.6 feet (1.5 to 2 meters), which will allow the benthic community to recover and recolonize, avoid direct interaction with finfish and benthic invertebrates, and minimize impacts from EMF. | Finfish, Invertebrates, and Essential Fish Habitat | N/A – best practice |
| FIN-04 | Dynamically positioned vessels and jet plow embedment will be used to the maximum extent practicable to reduce sediment disturbance during cable laying processes. | Finfish, Invertebrates, and Essential Fish Habitat | N/A – best practice |
| FIN-05 | Operate vessels in compliance with regulatory requirements related to the prevention and control of discharges and accidental spills. | Finfish, Invertebrates, and Essential Fish Habitat | N/A – best practice |
| FIN-06 | Accidental spill or release of oils or other hazardous materials will be managed through the OSRP. | Finfish, Invertebrates, and Essential Fish Habitat | BSEE, USCG, USEPA, and NJDEP |
| FIN-07 | An anchoring plan will be employed for areas where anchoring is required to avoid impacts on sensitive habitats to the maximum extent practicable, including hard bottom and structurally complex habitats, identified through the interpretation of site-specific HRG and benthic assessments. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM and NMFS |
| FIN-08 | Soft starts and gradual "ramp-up" procedures (i.e., gradually increasing sound output levels) will be employed for activities such as pile driving to allow mobile individuals to vacate the area during noise-generating activities. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| FIN-09 | During impact pile driving, a noise abatement system consisting of one or more available technologies (e.g., bubble curtains evacuated sleeve systems, encapsulated bubble systems, Helmholtz resonators) will be implemented to decrease the propagation of potentially harmful noise. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| FIN-10 | Nearshore cable installation activities will be conducted outside of the anticipated peak period of sandbar shark nursery and pupping activity between June 1 and September 1. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| FIN-11 | A fishery monitoring plan will be implemented to monitor baseline environmental conditions relevant to fisheries and how these conditions may change throughout Project construction and operation. | Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| MAR-01 | Vessel strike avoidance procedures will be implemented that reduce the potential risk of Project-related vessel collisions with marine mammals, including the following actions (i.e., MAR-02 through MAR-05). | Marine Mammals | BOEM, BSEE, USEPA, NMFS, and USACE |
| MAR-02 | Adhere to marine wildlife viewing and safe boating guidelines (GARFO 2021) to the maximum extent practicable. | Marine Mammals | BOEM, BSEE, and NMFS |

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| MAR-03 | Train Project personnel in marine mammal spotting and identification, observation reporting protocols, and vessel strike avoidance procedures, as applicable. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-04 | Adhere to applicable NOAA-established Seasonal Management Area and Dynamic Management Area speed restrictions for the North Atlantic right whale (NARW), which are currently 10 knots (18.5 kilometers per hour) or less for vessels 65 feet (20 meters) or greater during reported periods of high density. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-05 | Monitor marine mammal activity during all Project phases to ensure that the chances for possible marine mammal strikes are minimized. Specifically, Atlantic Shores will monitor NOAA notifications from the Right Whale Slow Zones Program, online or the "Whale Alert" app and the NOAA Right Whale Sighting Advisory System for NARW activity in the Offshore Project area. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-06 | Marine debris caught on Offshore Project structures will be removed, when safe and practicable, to reduce the risk of marine mammal entanglement. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-07 | Marine mammal protection zones will be established and monitored to create sufficient opportunity to modify or halt Project activities potentially harmful to protected species, such as: Shutdown Zones around activities that have the potential to harm marine mammals, and Clearance Zones (larger than Shutdown Zones) around activities that have the potential to result in the harassment of marine mammals. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-08 | Visual monitoring of Shutdown and Clearance Zones by NOAA Fisheries-approved Protected Species Observers (PSOs) will be conducted to alert the Project's survey and/or marine construction teams to the presence of protected species, including vessel-based and/or aerial monitoring of large Shutdown Zones and Clearance Zones, and use of night vision devices such as night vision binoculars and/or infrared cameras, during nighttime activities and/or periods of inclement weather. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-09 | Implement passive acoustic monitoring (PAM) to support the detection of vocalizing marine mammals during periods of inclement weather, low visibility, and/or at night. Passive acoustic monitors will be deployed in combination with visual observations. Current PAM technologies include towed hydrophone arrays, stationary autonomous buoys, and autonomous underwater vehicles and gliders. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-10 | Pile driving will follow a proposed schedule from May to December to minimize risk to NARW. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-11 | Pile driving will follow a proposed schedule that avoids the completion of pile driving after dark. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-12 | Equipment operating procedures will be implemented, as appropriate, to control the noise generated by pile driving or survey equipment to prevent exposure of harmful sound levels to protected marine life. Noise Abatement Systems (NAS) will be implemented during impact pile driving to decrease the propagation of potentially harmful underwater noises; soft starts will be considered for impact pile driving, ramp-up procedures whereby the sound source level is increased gradually before full power will be used; and a ramp-down and if necessary, a shutdown of activities such as pile driving and/or HRG survey equipment that has the potential to cause harm or harassment to marine mammals will occur if an animal is seen approaching or entering a Clearance or Shutdown Zone. | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-13 | Investigate the application of acoustic technologies (e.g., passive underwater acoustic monitors, cable hydrophones) that can provide near real-time monitoring of marine mammal vocalizations indicating species presence in an area. | Marine Mammals | N/A – best practice |
| MAR-14 | Investigate the application of Autonomous Underwater Vehicles technologies to allow for remotely controlled data collection of the underwater environment without divers or intrusive methods to detect marine life and changing environmental conditions during certain Project activities (e.g., construction). | Marine Mammals | BOEM, BSEE, and NMFS |
| MAR-15 | Investigate the application of Unmanned Aerial Systems, by conducting a field trial during an offshore wind survey using drone technology to monitor for protected species. The Unmanned Aerial Systems would be mounted with a high-definition stabilized infrared camera system specifically designed for small, unmanned vehicles. A trial would be configured whereby a PSO team monitor high-definition drone camera footage in real time on shore, while a PSO team simultaneously monitors visually from a selected platform. | Marine Mammals | BOEM, BSEE, and NMFS |
| SEA-01 | Vessel strike avoidance procedures will be implemented that reduce the potential risk of Project-related vessel collisions with sea turtles, including the following actions: adhere to marine wildlife viewing and safe boating guidelines (NOAA 2018) to minimize vessel interactions to the maximum extent practicable, and train Project personnel in sea turtle spotting and identification, observation reporting protocol and vessel strike avoidance procedures. | Sea Turtles | BOEM, BSEE, EPA, NMFS, and USACE |
| SEA-02 | Marine debris caught on Offshore Project structures will be removed, when safe and practicable, to reduce the risk of sea turtle entanglement. | Sea Turtles | BOEM, BSEE, and NMFS |
| SEA-03 | Protection zones will be established and monitored to create sufficient opportunity to modify or halt Project activities potentially harmful to protected species, such as: Shutdown Zones around activities that have the potential to harm sea turtles and a Clearance Zone (larger than Shutdown Zone) around activities that have the potential to result in the harassment of sea turtles. | Sea Turtles | BOEM, BSEE, and NMFS |
| SEA-04 | Visual monitoring of Shutdown and Clearance Zones by NOAA Fisheries-approved PSOs will be conducted to alert the Project's survey and/or marine construction teams to the presence of protected species, including vessel-based and/or aerial monitoring of large Shutdown Zones and Clearance Zones; and the use of night vision devices such as night vision binoculars and/or infrared cameras, during nighttime activities and/or periods of inclement weather. | Sea Turtles | NMFS |
| SEA-05 | Pile driving will follow a proposed schedule that avoids the completion of pile driving after dark. | Sea Turtles | N/A – best practice |
| SEA-06 | Equipment operating procedures will be implemented, as appropriate, to control the noise generated by pile driving or survey equipment to prevent exposure of harmful sound levels to protected marine life. NAS will be implemented during impact pile driving to decrease the propagation of potentially harmful underwater noises; soft starts will be considered for activities such as impact pile driving, ramp-up procedures whereby the sound source level is increased gradually before | Sea Turtles | BOEM, BSEE, and NMFS |

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| | full power will be used; and a ramp-down and if necessary, a shutdown of activities such as pile driving and/or HRG survey equipment that has the potential to cause harm or harassment to sea turtles will occur if an animal is seen approaching or entering a Clearance or Shutdown Zone. | | |
| SEA-07 | Investigate the application of Unmanned Aerial Systems, by conducting a field trial during an offshore wind survey using drone technology to monitor for protected species. The Unmanned Aerial Systems would be mounted with a high-definition stabilized infrared camera system specifically designed for small, unmanned vehicles. A trial would be configured whereby a PSO team monitor high-definition drone camera footage in real time on shore, while a PSO team simultaneously monitors visually from a selected platform. | Sea Turtles | BOEM, BSEE, and NMFS |
| VIS-01 | The Project will be located in a designated offshore wind development area that has been identified by BOEM as suitable for the proposed type of development. | Scenic and Visual | N/A – best practice |
| VIS-02 | The larger of the OSSs under consideration for the Project are proposed to be placed further offshore in order to reduce potential visibility. | Scenic and Visual | N/A – best practice |
| VIS-03 | The WTGs will be painted no lighter than Pure White (RAL 9010) and no darker than Light Grey (RAL 7035) to eliminate the need for daytime warning lights or red paint marking of the blade tips. | Scenic and Visual | N/A – best practice |
| VIS-04 | WTGs, OSSs, and the met tower will be marked and lit in accordance with the minimum FAA, BOEM, and USCG requirements necessary to maintain navigation and aviation safety. | Scenic and Visual | BOEM and USCG |
| VIS-05 | ADLS will be used, if practicable and permitted, to reduce the time the aviation obstruction lighting on WTGs is illuminated. | Scenic and Visual | BOEM and BSEE |
| VIS-06 | Onshore interconnection cables will be installed underground rather than on aboveground structures. | Scenic and Visual | Not an enforceable measure |
| VIS-07 | Onshore substations will be sited adjacent to parcels zoned for commercial or industrial use. | Scenic and Visual | N/A – best practice |
| VIS-08 | Vegetative screening will be installed to provide a screening/softening buffer between the substation and/or converter station sites and sensitive users/land uses. | Scenic and Visual | N/A – best practice |
| VIS-09 | All infrastructure will be decommissioned at the end of the Project's life cycle. | Scenic and Visual | N/A – best practice |
| VIS-10 | Guidance and standards will meet the requirements set forth by the applicable local regulations for the onshore substation and/or converter station sites and O&M facility. Additional mitigation, if necessary, will be drawn from the National Park Service Sustainable Outdoor Lighting best practices and Bureau of Land Management (BLM) Technical Note 457 Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands. Examples of sustainable lighting measures include use of LEDs, focused task lighting, and fully shielded lights. | Scenic and Visual | N/A – best practice |
| VIS-11 | Onshore facilities including buildings, fences, and specular steel structures throughout the substation/converter stations and O&M facilities will employ neutral colors, treatments, or coatings to minimize contrast of structures when viewed against a natural background and blend with vernacular materials. Elements requiring galvanized steel will be dulled during manufacturing to minimize glare. | Scenic and Visual | N/A – best practice |
| VIS-12 | The design of the substation and/or converter station will specify the lowest profile components practicable, occupy the smallest site footprint, and limit the horizontal and vertical extent of the proposed equipment. | Scenic and Visual | N/A – best practice |
| VIS-13 | The onshore facilities will utilize buried electrical cables rather than overhead conductors to minimize visual impacts. | Scenic and Visual | N/A – best practice |
| VIS-14 | Where applicable the substation and/or converter station will utilize non-specular conductors and galvanized materials will be chemically dulled during the manufacturing process. | Scenic and Visual | N/A – best practice |
| VIS-15 | The substation and/or converter station components and site will be maintained to ensure a clean and orderly appearance. | Scenic and Visual | N/A – best practice |
| CUL-01 | Atlantic Shores engaged with relevant stakeholders to identify additional avoidance, minimization, or mitigation measures regarding potential effects on aboveground historic properties as required by 30 CFR 585.626(b)(15). | Cultural – Architectural Resources and Aboveground Historic Properties | N/A – best practice |
| CUL-02 | The Project will be located in a designated offshore wind development area that has been identified by BOEM as suitable for development. | Cultural – Architectural Resources and Aboveground Historic Properties | N/A – best practice |
| CUL-03 | The OSSs will be set back sufficiently to minimize their visibility from the shore. | Cultural – Architectural Resources and Aboveground Historic Properties | N/A – best practice |
| CUL-04 | The WTGs will be painted no lighter than Pure White (RAL 9010) and no darker than Light Grey (RAL 7035) as recommended by BOEM and the FAA. Turbines of this color eliminate the need for daytime warning lights or red paint marking of the blade tips. | Cultural – Architectural Resources and Aboveground Historic Properties | BOEM and BSEE |
| CUL-05 | ADLS or related means (e.g., dimming or shielding) will be used to limit visual impact, pursuant to approval by the FAA and BOEM, commercial and technical feasibility at the time of Facility Design Report (FDR)/Fabrication and Installation Report (FIR) approval, and dialogue with stakeholders. | Cultural – Architectural Resources and Aboveground Historic Properties | BOEM and BSEE |

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| CUL-06 | Onshore interconnection cables will be installed underground, thus avoiding potential effects on the visual setting of historic properties. | Cultural – Architectural Resources and Aboveground Historic Properties | Not an enforceable measure |
| CUL-07 | Onshore substations and/or converter stations will be sited near existing substations, or on parcels zoned for commercial and industrial/utility use. | Cultural – Architectural Resources and Aboveground Historic Properties | N/A – best practice |
| CUL-08 | Screening will be implemented at the onshore substation and/or converter station sites to the maximum extent practicable to reduce potential visibility and noise. | Cultural – Architectural Resources and Aboveground Historic Properties | N/A – best practice |
| CUL-09 | Electrical equipment will be installed within certified enclosures to reduce potential noise impacts. | Cultural – Architectural Resources and Aboveground Historic Properties | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| CUL-10 | Research and investigative studies related to preserving existing shoreline and coastal features that contribute to historic settings of the affected properties may be completed. | Cultural – Architectural Resources and Aboveground Historic Properties | N/A – best practice |
| CUL-11 | Historic Properties Treatment Plans (HPTPs) have been developed for specific aboveground properties determined by BOEM to be adversely affected by the Project and a mitigation fund will be implemented to address the remainder of the adversely affected aboveground historic properties. | Cultural – Architectural Resources and Aboveground Historic Properties | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| CUL-12 | Onshore facilities have been primarily sited within previously disturbed and developed areas (e.g., roadways, ROWs, previously developed industrial/commercial areas) to the maximum extent practicable, to avoid or minimize impacts on previously unrecorded archaeological resources. | Cultural – Terrestrial Archaeological Resources | N/A – best practice |
| CUL-13 | Any remaining terrestrial archaeological (Phase IB) investigations of the terrestrial APE will be completed in accordance with the Phased Identification and Evaluation process developed based on BOEM's consultations with the New Jersey State Historic Preservation Office (SHPO) and as stipulated in the NHPA Section 106 Memorandum of Agreement (MOA). | Cultural – Terrestrial Archaeological Resources | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| CUL-14 | Site onshore facilities in areas where there are no previously identified archaeological resources, thereby avoiding, and minimizing impacts on known terrestrial archaeological resources. | Cultural – Terrestrial Archaeological Resources | N/A – best practice |
| CUL-15 | An Unanticipated Discovery Plan will be implemented that will include stop-work and notification procedures to be followed if a cultural resource is encountered during construction. | Cultural – Terrestrial Archaeological Resources | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| CUL-16 | Identify historic-period marine archaeological resources and ancient submerged landforms that are the most likely locations for pre-contact archaeological sites and that retain preservation potential. | Cultural – Marine Archaeological Resources | N/A – best practice |
| CUL-17 | Establish approximately 164 feet (50 meter) protective buffers recommended by the QMA around each identified post-Contact marine archaeological resources or potential marine archaeological resource. | Cultural – Marine Archaeological Resources | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| CUL-18 | Consider all survey data, including potential marine archaeological resource locations and characteristics, to guide the siting, design, and engineering of Offshore Project components, including WTG and OSS foundations and offshore cables (export, interarray, and interlink cables) and planning for associated temporary construction activities (vessel jacking and anchoring). | Cultural – Marine Archaeological Resources | N/A – best practice |
| CUL-19 | Implement the Monitoring Plan and Post Review Discovery Plan: Submerged Cultural Resources for offshore construction activities. | Cultural – Marine Archaeological Resources | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| DEM-01 | Conducted an IMPLAN economic impact analysis model to estimate the Project's New Jersey workforce numbers. | Demographics, Employment, and Economics | N/A – best practice |
| DEM-02 | An O&M facility will be established in Atlantic City, New Jersey, to be staffed primarily with local workers. | Demographics, Employment, and Economics | N/A – best practice |
| DEM-03 | A diverse and local workforce will be hired (recruited from local training programs). | Demographics, Employment, and Economics | N/A – best practice |
| DEM-04 | Workforce initiatives will be established that will support minority and low-income populations, minority, and women-owned business enterprises, veterans, and underserved communities and participate in local chambers of commerce. | Demographics, Employment, and Economics | N/A – best practice |
| DEM-05 | Atlantic Shores will participate in multiple local chambers of commerce supporting minority groups. | Demographics, Employment, and Economics | N/A – best practice |

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| DEM-06 | Construction materials and other supplies will, to the extent possible and practical, be locally sourced, including vessel provisioning and servicing, and certain fabrication and assembly work. | Demographics, Employment, and Economics | N/A – best practice |
| DEM-07 | Vessels from in-state and other U.S.-flagged vessels will be used to the maximum extent practicable. | Demographics, Employment, and Economics | N/A – best practice |
| DEM-08 | Onshore construction will be scheduled to occur outside of summer tourist season (Memorial Day through Labor Day) and in accordance with local noise ordinances. | Demographics, Employment, and Economics | BOEM and NJDEP |
| DEM-09 | Local ports will be used to the maximum extent practicable. | Demographics, Employment, and Economics | N/A – best practice |
| EJ-01 | A workforce hiring program will be implemented and designed to benefit EJ and Disadvantaged Communities. | Environmental Justice | N/A – best practice |
| EJ-02 | Project infrastructure, such as cables, will be installed to avoid disproportionate impacts on EJ and Disadvantaged Communities. | Environmental Justice | N/A – best practice |
| EJ-03 | Atlantic Shores will support workforce initiatives that will have a strong focus on providing support to minority and low-income populations, women, veterans, and underserved communities and local chambers of commerce that support minority groups. | Environmental Justice | N/A – best practice |
| EJ-04 | A TMP will be developed for construction activities and traffic monitoring will be conducted. | Environmental Justice | NJDEP |
| EJ-05 | Onshore construction will be scheduled to occur outside summer tourist season (Memorial Day through Labor Day) and in accordance with local noise ordinances. | Environmental Justice | NJDEP and/or local authorities |
| EJ-06 | Atlantic Shores will update their website and coordinate with municipalities to inform members of the public of construction schedules. | Environmental Justice | Best practice–- not an enforceable measure |
| EJ-07 | Local ports will be used the maximum extent practicable. | Environmental Justice | N/A – best practice |
| REC-01 | Atlantic Shores has worked in collaboration with local communities to site Project facilities and develop Project construction techniques and schedules that will avoid disruption to the maximum extent possible. | Recreation and Tourism | NJDEP and local municipalities |
| REC-02 | Atlantic Shores will conduct onshore construction outside of the tourist season (Memorial Day to Labor Day). | Recreation and Tourism | NJDEP |
| REC-03 | The construction schedule will be developed in accordance with municipal noise ordinances. | Recreation and Tourism | NJDEP and local municipalities |
| REC-04 | Atlantic Shores is a founding member of the Responsible Offshore Science Alliance (ROSA), which advances regional research and monitoring of fishery and offshore wind interactions. | Recreation and Tourism – Recreational Fishing | Not an enforceable measure |
| REC-05 | Atlantic Shores signed a Memorandum of Understanding (MOU) with Stockton University to sponsor research to investigate technology development related to the development of offshore wind energy and to investigate potential fisheries benefits resulting from offshore wind structures. Findings from this research will be used to support the design and implementation of pre-, during, and post-construction fisheries monitoring. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-06 | Information from industry conversations, direct data gathering exercises with fishermen, consultations with government agency representatives, and analysis of public data have been compiled and used to guide the siting, design, O&M, and decommissioning of the Project. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-07 | Proposed layout was developed in close coordination with fishermen and to align with the predominant flow of vessel traffic. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-08 | Atlantic Shores will have the capability to mark each WTG, OSS, and met tower position (virtually or using physical transponders) with Automatic Identification System (AIS). The number, location, and type of AIS transponders will be determined in consultation with USCG. | Recreation and Tourism – Recreational Fishing | BOEM, BSEE, and USCG |
| REC-09 | Project infrastructure is being sited and oriented to avoid concentrated areas of recreational fishing activity (e.g., artificial reefs) to the maximum extent practicable. | Recreation and Tourism – Recreational Fishing | BOEM, BSEE, and NMFS |
| REC-10 | To facilitate safe navigation, all offshore structures will include marine navigation lighting and marking in accordance with USCG and BOEM guidance. Atlantic Shores will continue to work with USCG and BOEM to determine the appropriate marine lighting and marking schemes for the proposed offshore facilities. | Recreation and Tourism – Recreational Fishing | BOEM and USCG |
| REC-11 | Each permanent structure (including WTGs, OSSs, and met tower) will include unique alphanumeric identification and lights that are visible in all directions. Sound signals will be installed on select foundations in accordance with the Marking and Lighting Plan that will be developed in consultation with USCG. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-12 | WTG, OSS, met tower, and met buoy positions will be maintained with private aids to navigation (PATONs). | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-13 | WTG and OSS foundations will be equipped with access ladders to allow distressed mariners access to an open refuge area above the splash zone. The presence of a person on the offshore structure will be detected, for example, by cameras or intrusion detectors. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-14 | A Fisheries Communication Plan has been developed that defines outreach and engagement with fishing interests during all Project phases, from development through decommissioning. | Recreation and Tourism – Recreational Fishing | N/A – best practice |

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| REC-15 | Atlantic Shores has hired CLOs to help inform the public of Project activities and to support productive and effective dialogue with stakeholders. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-16 | Atlantic Shores employs an active commercial fisherman as the Fisheries Liaison Officer (FLO) and an active recreational fisherman as the Recreational Fishing Industry Representative to support communication and feedback from the fishing community. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-17 | A "For Mariners" Project webpage (www.atlanticshoreswind.com/mariners/) has been developed that contains the latest news and events, real-time Project buoy data display and Project vessel tracking chart, Project vessel schedules, and FLO and Recreational Fishing Industry Representative contact information. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-18 | Updated asset and operational awareness bulletins will be regularly distributed showing the development area, depicted on local nautical charts, with a description of the assets in the area, the activities taking place, timelines, and relevant contact information. Atlantic Shores will also publish announcements and share updates with print and online industry publications and local news outlets. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-19 | Specific methods for communicating with offshore fishermen while they are at sea are being established, including a 24-hour phone line to address any real-time operational conflicts and/or safety issues. | Recreation and Tourism – Recreational Fishing | BOEM and BSEE |
| REC-20 | A Marine Coordinator will be employed to monitor daily vessel movements, implement communication protocols with external vessels both in port and offshore to avoid conflicts, and monitor safety zones. Daily coordination meetings between contractors are expected to be held to avoid conflicting operations at port facilities and transit routes to the Offshore Project area. The Marine Coordinator will be responsible for coordinating with USCG for any required Local Notice to Mariners (LNMs). | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| REC-21 | Offshore cables will be buried at a sufficient depth of 5 to 6.6 feet (1.5 to 2 meters) to avoid interaction with fishing gear. | Recreation and Tourism – Recreational Fishing | N/A – best practice |
| COM-01 | A desktop assessment of commercial fishing activity in the Offshore Project area was conducted using publicly available data (AIS, Vessel Trip Report, and Vessel Monitoring System), reports, academic studies, information from fishermen, and consultations with government agency representatives and stakeholders to select a layout that will facilitate ongoing transit and fishing activities. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-02 | Atlantic Shores is a founding member of the ROSA, which advances regional research and monitoring of fishery and offshore wind interactions. Findings from these efforts will inform the Project design and will help to build data and communication tools for fishermen that support accurate, real-time information on offshore wind projects. | Commercial Fisheries and For-Hire Recreational Fishing | Not an enforceable measure |
| COM-03 | Atlantic Shores signed an MOU with Stockton University to sponsor research to investigate technology development related to the development of offshore wind energy and to investigate potential fisheries benefits resulting from offshore wind structures. Findings from this research will be used to support the design and implementation of pre-, during, and post-construction fisheries monitoring. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-04 | Information from industry conversations, direct data gathering exercises with fishermen, consultations with government agency representatives, and analysis of public data have been compiled and used to guide the siting, design, O&M, and decommissioning of the Project. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-05 | The proposed layout was developed in close coordination with commercial fishermen to align with the predominant flow of vessel traffic. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-06 | Project infrastructure is being sited and oriented to avoid concentrated areas of fishing activity to the maximum extent practicable. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice. |
| COM-07 | The amount of cable protection will be limited. Cable protection will be designed to minimize effects on fishing gear to the maximum extent practicable, and fishermen will be informed of the areas where cable protection is installed. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM and BSEE |
| COM-08 | To facilitate safe navigation, all offshore structures will include marine navigation lighting and marking in accordance with USCG and BOEM guidance. Atlantic Shores will continue to work with USCG and BOEM to determine the appropriate marine lighting and marking schemes for the proposed offshore facilities. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM, BSEE, and USCG |
| COM-09 | Each permanent structure (including WTGs, OSSs, and the met tower) will include unique alphanumeric identification and lights that are visible in all directions. Sound signals will be installed on select foundations in accordance with the Marking and Lighting Plan that will be developed in consultation with USCG. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-10 | WTG, OSS, met tower, and met buoy positions will be maintained with PATONs. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-11 | WTG and OSS foundations will be equipped with access ladders to allow distressed mariners access to an open refuge area above the splash zone. The presence of a person on the offshore structure will be detected, for example, by cameras or intrusion detectors. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-12 | Atlantic Shores will have the capability to mark each WTG, OSS, and met tower position (virtually or using physical transponders) with AIS. The number, location, and type of AIS transponders will be determined in consultation with USCG. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM, BSEE, and USCG |

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| COM-13 | A Fisheries Communication Plan has been developed that defines outreach and engagement with fishing interests during all phases of the Project, from development through decommissioning. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-14 | Atlantic Shores employs an active commercial fisherman as the FLO and an active recreational fisherman as the Recreational Fishing Industry Representative. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-15 | A Gear Loss Avoidance Program has been developed to identify gear located within the Project area and to develop a cooperative plan with fishermen to avoid, remove, or relocate fishing gear within areas of Project activity. This plan includes direct outreach to fishermen and a scout boat plan to identify fishing gear located within areas of Project activity. A gear loss form and policy has been made accessible on the Project's website. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM and BSEE |
| COM-16 | A "For Mariners" project webpage (www.atlanticshoreswind.com/mariners/) has been developed that contains the latest news and events, real-time Project buoy data display and Project vessel tracking chart, Project vessel schedules, and FLO and Recreational Fishing Industry Representative contact information. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-17 | Specific methods for communicating with offshore fishermen while they are at sea are being established, including a 24-hour phone line to address any real-time operational conflicts and/or safety issues. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-18 | Updated asset and operational awareness bulletins will be regularly distributed showing the development area, depicted on local nautical charts, with a description of the assets in the area, the activities taking place, timelines, and relevant contact information. Atlantic Shores will also publish announcements and share updates with print and online industry publications and local news outlets. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-19 | Atlantic Shores distributed a formal Request for Information to identify fishing businesses that had available docks and port real estate to support the Project. | Commercial Fisheries and For-Hire Recreational Fishing | N/A – best practice |
| COM-20 | A Marine Coordinator will be employed to monitor daily vessel movements, implement communication protocols with external vessels both in port and offshore to avoid conflicts, and monitor safety zones. Daily coordination meetings between contractors are expected to be held to avoid conflicting operations at port facilities and transit routes to the Offshore Project area. The Marine Coordinator will be responsible for coordinating with USCG for any required LNMs. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM, BSEE and USCG |
| COM-21 | Since June 2021, NJDEP has led a multi-state compensatory mitigation initiative that includes the States of New Jersey, New York, Massachusetts, Connecticut, Rhode Island, New Hampshire, Maine, Delaware, Maryland, Virginia, and North Carolina to encourage BOEM to develop a standardized fisheries compensation framework, which guidance is near final, and the states have partnered to establish a regional administrator to manage the future mitigation funds. In contributing to the Compensatory Mitigation Fund, Atlantic Shores has agreed to:<br>• Utilize the regional fund administrator of the Compensatory Mitigation Fund that is currently being established by the 11 coastal states initiative; or utilize another method of administration as directed by the State of New Jersey.<br>• Establish a Navigational Safety Adaptation Fund and a Gear Loss and Damage Compensation program to address fisheries mitigation. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM and NJDEP |
| LAN-01 | A Marine Coordinator will be used to manage any increase in vessel movements during Project construction, O&M, and decommissioning. | Land Use and Coastal Infrastructure | BOEM, BSEE, and USCG |
| LAN-02 | A desktop assessment has been conducted of the relevant land uses and coastal infrastructure to avoid and minimize effects. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-03 | HDD cable installation will be used at the landfall sites to minimize land disturbance. Land disturbance will be temporary, and disturbed areas will be restored to their previous condition, except for the proposed manholes that will be used for access to maintain the cables. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-04 | Onshore interconnection cable routes have been routed primarily along previously disturbed ROWs. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-05 | Onshore substations and/or converter stations have been sited on previously disturbed lands to minimize effects on surrounding land uses and to be compatible with the existing zoned use. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-06 | Implement design elements (e.g., certified enclosures, natural barriers, and landscaping around the onshore substations and converter stations) to minimize effects on surrounding land uses and communities. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-07 | Access for repairs on the interconnection cables will take place through manholes, and repairs will be completed within the installed transmission infrastructure, thus minimizing land disturbance. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-08 | Voluntary seasonal construction restrictions for onshore interconnection cable installation will be followed. | Land Use and Coastal Infrastructure | N/A – best practice |
| LAN-09 | Erosion and sedimentation control measures will be utilized during construction at the landfall sites and along the onshore interconnection cable routes. | Land Use and Coastal Infrastructure | BSEE, USCG, EPA, and NJDEP |
| LAN-10 | A job-site safety program will be implemented to prevent public access to the Project's construction site. | Land Use and Coastal Infrastructure | N/A – best practice |
| NAV-01 | A Navigation Safety Risk Assessment (NSRA) was conducted to assess navigation safety. | Navigation and Vessel Traffic | BOEM |

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| NAV-02 | An aerial SAR risk assessment with associated mitigation measures was prepared in coordination with USCG, BOEM and other relevant stakeholders. All construction and installation vessels and equipment will display the required navigation lighting and day shapes and make use of AIS as required by USCG. | Navigation and Vessel Traffic | BOEM, BSEE, and USCG |
| NAV-03 | The proposed WTG and OSS layout has been developed in consideration of commercial fishing patterns and in close coordination with the surf clam/quahog dredging fleet. The layout is designed to facilitate the transit of vessels through the WTA based on a review of existing traffic patterns. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-04 | To facilitate safe navigation, all offshore structures will include marine navigation lighting and marking in accordance with USCG and BOEM guidance. Atlantic Shores will continue to work with USCG and BOEM to determine the appropriate marine lighting and marking schemes for the proposed offshore facilities. | Navigation and Vessel Traffic | BOEM, BSEE, and USCG |
| NAV-05 | Each permanent structure (including WTGs, OSSs, and the met tower) will include unique alphanumeric identification and lights that are visible in all directions. Sound signals will be installed on select foundations in accordance with the Marking and Lighting Plan that will be developed in consultation with USCG. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-06 | Atlantic Shores will have the capability to mark each WTG, OSS, and met tower position (virtually or using physical transponders) with AIS. The number, location, and type of AIS transponders will be determined in consultation with USCG. | Navigation and Vessel Traffic | BOEM, BSEE, and USCG |
| NAV-07 | WTG, OSS, met tower, and met buoy positions will be maintained with PATONs. | Navigation and Vessel Traffic | USCG |
| NAV-08 | WTG and OSS foundations will be equipped with access ladders to allow distressed mariners access to an open refuge area above the splash zone. The presence of a person on the offshore structure will be detected, for example, by cameras or intrusion detectors. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-09 | The feasibility of installing very high frequency (VHF) direction finding equipment, real-time weather measurements, and high-resolution infrared detection systems to assist in detection of persons in water or vessels is being evaluated. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-10 | An ERP will be developed to specify coordination, shutdown, and rescue procedures. The ERP will be reviewed and updated at least annually between Atlantic Shores and BSEE with input from USCG, as appropriate. | Navigation and Vessel Traffic | BOEM and BSEE |
| NAV-11 | Updated asset and operational awareness bulletins will be regularly distributed showing the development area, depicted on local nautical charts, with a description of the assets in the area, the activities taking place, timelines, and relevant contact information. Atlantic Shores will also publish announcements and share updates with print and online industry publications and local news outlets. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-12 | A "For Mariners" project webpage (www.atlanticshoreswind.com/mariners/) has been developed that contains the latest news and events, real-time Project buoy data display and Project vessel tracking chart, Project vessel schedules, and FLO and Recreational Fishing Industry Representative contact information. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-13 | Specific methods for communicating with offshore fishermen while they are at sea are being established, including a 24-hour phone line to address any real-time operational conflicts and/or safety issues. | Navigation and Vessel Traffic | N/A – best practice |
| NAV-14 | A Marine Coordinator will be employed to monitor daily vessel movements, implement communication protocols with external vessels both in port and offshore to avoid conflicts, and monitor safety zones. Daily coordination meetings between contractors are expected to be held to avoid conflicting operations at port facilities and transit routes to the Offshore Project area. The Marine Coordinator will be responsible for coordinating with USCG for any required LNMs. | Navigation and Vessel Traffic | N/A – best practice |
| OTH-01 | Desktop assessments of military activities, sand resources, and offshore energy, cables, and pipelines have been conducted to characterize marine uses and military activities. | Other Uses – Marine and Military Activities | N/A – best practice |
| OTH-02 | Offshore Project infrastructure has been sited and designed to avoid or minimize impacts on sand resource areas, cables/pipelines, and known MEC to the maximum extent practicable. | Other Uses – Marine and Military Activities | N/A – best practice |
| OTH-03 | The Project facilities will avoid stormwater outfalls and water intake structures that are identified during constructability studies, stakeholder consultation, and pre-construction surveys to the maximum extent practicable. Atlantic Shores will adhere to any buffers or offsets in accordance with state or local requirements to conduct work near these outfalls or structures. | Other Uses – Marine and Military Activities | BSEE, USCG, USEPA, and NJDEP |
| OTH-04 | Cable protection infrastructure will be employed where offshore cables are proposed to cross existing submarine cables. Atlantic Shores is coordinating with cable owners who own assets within the Offshore Project area regarding crossing methods and setbacks. | Other Uses – Marine and Military Activities | N/A – best practice |
| OTH-05 | Coordination will continue with military staff and DoD throughout the life of the Project. | Other Uses – Marine and Military Activities | N/A – best practice |
| OTH-06 | Consultation will continue with agencies and other research entities regarding scientific research and surveys in the Offshore Project area. Atlantic Shores construction and O&M monitoring will provide additional contributions to scientific surveys and research. | Other Uses – Marine and Military Activities | N/A – best practice |
| OTH-07 | A Marine Coordinator will be employed to monitor daily vessel movements, implement communication protocols with external vessels both in port and offshore to avoid conflicts, and monitor safety zones. | Other Uses – Marine and Military Activities | N/A – best practice |
| AVI-01 | Site-specific studies for the WTGs were conducted including an Obstruction Evaluation and Airspace Analysis and Air Traffic Flow Analysis and Navigational and Radar Screening Study studies to determine impacts on aviation and radar resources, respectively. | Aviation and Radar | BOEM, BSEE, and USCG |
| AVI-02 | An aerial SAR risk assessment report, including associated mitigation measures, has been prepared in coordination with USCG to mitigate risk to SAR operations within the WTA. | Aviation and Radar | BOEM, BSEE, and USCG |

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| AVI-03 | Atlantic Shores coordinated with USCG to design a Project that provides sufficient WTG spacing to allow for safe aerial SAR. | Aviation and Radar | BOEM, BSEE, and USCG |
| AVI-04 | Install a direction finder system to assist with the location of vessels in distress and persons overboard with a transponder. | Aviation and Radar | N/A – best practice |
| AVI-05 | Install high-resolution infrared cameras to detect, day or night and all-weather conditions, thermal images (e.g., vessels or a person in the water) across the entire Lease Area. | Aviation and Radar | N/A – best practice |
| AVI-06 | Install weather monitoring devices. | Aviation and Radar | N/A – best practice |
| AVI-07 | Hire a Marine Coordinator to liaise with USCG as required during SAR activity within the WTA, particularly with emergency braking of selected WTG rotors. | Aviation and Radar | BOEM, BSEE, and USCG |
| AVI-08 | Develop an ERP to specify coordination, shutdown, and rescue procedures. The ERP will be reviewed and updated at least annually between Atlantic Shores and USCG. | Aviation and Radar | BOEM, BSEE, and USCG |
| AVI-09 | Atlantic Shores will mark and light all structures in accordance with FAA, BOEM and USCG guidelines. | Aviation and Radar | BOEM, BSEE, USCG |
| AVI-10 | Continue ongoing Project coordination with FAA, BOEM, DoD through the Military Aviation and Installation Assurance Siting Clearinghouse, and USCG. | Aviation and Radar | BOEM, BSEE, and USCG |
| ONS-01 | A desktop assessment has been conducted of onshore transportation and traffic to inform Project design decisions. | Onshore Transportation and Traffic – Navigation and Vessel Traffic | N/A – best practice |
| ONS-02 | Voluntary, seasonal construction restrictions will be implemented, and local construction hour ordinances will be followed to avoid peak traffic usage. | Onshore Transportation and Traffic – Navigation and Vessel Traffic | N/A – best practice |
| ONS-03 | A TMP that includes traffic control measures (e.g., signage, police details, lane closures, and detours, and implementation of BMPs) will be developed and implemented. | Onshore Transportation and Traffic – Navigation and Vessel Traffic | N/A – best practice |
| ONS-04 | The public will be informed of construction locations and schedules using a variety of communication tools (e.g., via the Atlantic Shores website, news releases, community meetings, or other means). | Onshore Transportation and Traffic – Navigation and Vessel Traffic | N/A – best practice |
| NOI-01 | Implement seasonal restrictions on construction activity to avoid months (January to April) when NARW densities are higher. | Noise – In-Air Noise and Hydroacoustics | BOEM, BSEE, and NMFS |
| NOI-02 | Initiate pile driving only when it is expected that pile driving can be completed during daylight hours. | Noise – In-Air Noise and Hydroacoustics | BOEM, BSEE, and NMFS |
| NOI-03 | Implement equipment operating procedures (e.g., soft starts, ramp-downs, and shut-downs). | Noise – In-Air Noise and Hydroacoustics | BOEM, BSEE, and NMFS |
| NOI-04 | Implement daytime and nighttime visual monitoring by NOAA Fisheries–approved PSOs. | Noise – In-Air Noise and Hydroacoustics | BOEM, BSEE, and NMFS |
| NOI-05 | Use PAM during impact pile-driving activities. | Noise – In-Air Noise and Hydroacoustics | BOEM, BSEE, and NMFS |
| NOI-06 | Evaluate innovative monitoring technologies such as autonomous underwater vehicles and unmanned aerial systems. | Noise – In-Air Noise and Hydroacoustics | N/A – best practice |
| NOI-07 | Designate species-specific shutdown and clearance zones. | Noise – In-Air Noise and Hydroacoustics | BOEM, BSEE, and NMFS |
| PUB-01 | An NSRA was prepared to assess navigation safety risks (COP Volume II, Appendix II-S; Atlantic Shores 2024). The WTG orientation and uniform grid layout was selected to avoid and minimize the risk of collision and allision. An ERP will be developed in part to address the unlikely events of collisions, allisions, vessels in distress, man overboard, and SAR. | Public Health and Safety | BOEM, BSEE, and USCG |
| PUB-02 | An extensive EMF modeling assessment was conducted for the offshore cables and OSSs to assess potential effects on marine life. | Public Health and Safety | N/A – best practice |
| PUB-03 | To facilitate safe navigation, all offshore structures will include marine navigation lighting and marking in accordance with USCG and BOEM guidance. Atlantic Shores will continue to work with USCG and BOEM to determine the appropriate marine lighting and marking schemes for the proposed offshore facilities. | Public Health and Safety | BOEM, BSEE, and USCG |
| PUB-04 | Each permanent structure (including WTGs, OSSs, and the met tower) will include unique alphanumeric identification and lights that are visible in all directions. Sound signals will be installed on select foundations in accordance with the Marking and Lighting Plan that will be developed in consultation with USCG. | Public Health and Safety | N/A – best practice |

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| PUB-05 | Atlantic Shores will have the capability to mark each WTG, OSS, and met tower position (virtually or using physical transponders) with AIS. The number, location, and type of AIS transponders will be determined in consultation with USCG. | Public Health and Safety | BOEM, BSEE, and USCG |
| PUB-06 | The Project facilities are designed to withstand maximum-case scenario severe weather events based on site-specific meteorological, oceanographic, and geological conditions and will conform to all applicable standards. | Public Health and Safety | N/A – best practice |
| PUB-07 | The Project will undergo a thorough and well-vetted structural design process in accordance with applicable standards and based on site-specific conditions. The Project design will be reviewed by BSEE and will also be verified by an independent certified verification agent pursuant to 30 CFR 285.705–285.710 and 285.712–285.714 as part of the FDR and FIR. | Public Health and Safety | BSEE |
| PUB-08 | A Site Manager will be employed to control access to offshore facilities, only allowing personnel with proper training, certificates, and medical fitness. Proper signage restricting access will be installed on the WTG, OSS, and met tower foundations. | Public Health and Safety | N/A – best practice |
| PUB-09 | Temporary safety buffer zones will be established around offshore working areas to reduce hazards. | Public Health and Safety | N/A – best practice |
| PUB-10 | Solid and liquid wastes will be managed in accordance with applicable regulations to reduce the risk of spills, discharges, and accidental releases. | Public Health and Safety | N/A – best practice |
| PUB-11 | Implement mitigation measures to assist with SAR including implementation of WTG rotor emergency braking systems during a SAR event, measures to assist in search detection (e.g., installation of VHF direction finding equipment and high-resolution infrared detection systems), and access ladders to open refuge areas on foundations for distressed mariners. | Public Health and Safety | BOEM, BSEE, and USCG |
| PUB-12 | The Project will be monitored 24 hours per day and will be equipped with a SCADA system, which provides an interface between the Project facilities and all environmental and condition monitoring sensors and allows the operator to control the Project's equipment remotely. | Public Health and Safety | N/A – best practice |
| PUB-13 | Offshore cables will be equipped with distributed temperature system, distributed acoustic sensing, and/or online partial discharge to constantly assess and monitor the status of the offshore cables. | Public Health and Safety | N/A – best practice |
| PUB-14 | An extensive EMF modeling assessment was conducted to assess the landfall sites, the underground onshore interconnection cables, and the onshore substations and/or converter stations. All modeled EMF levels are well below guidelines protective of human health. | Public Health and Safety | N/A – best practice |
| PUB-15 | Once operational, onshore substations and/or converter stations will be equipped with fencing, screening barriers, camera systems, signage, and physical barriers as part of a security plan. | Public Health and Safety | N/A – best practice |
| PUB-16 | Active, onshore worksites will be secured with temporary fencing and signage to prevent public access and trenches or holes will be covered in compliance with permit requirements. | Public Health and Safety | N/A – best practice |
| PUB-17 | A TMP including traffic control measures (e.g., signage, police details, lane closures, detours) will be developed and implemented. | Public Health and Safety | N/A – best practice |
| PUB-18 | Refueling and major equipment maintenance will be performed off site (e.g., at commercial service stations or a contractor's yard) to the maximum extent practicable. | Public Health and Safety | N/A – best practice |
| PUB-19 | An SPCC will be developed and maintained, and spill kits will be provided at all locations where hazardous materials are stored. | Public Health and Safety | BSEE, USCG, USEPA, and NJDEP |
| PUB-20 | The Project will result in a region-wide net decrease in harmful air pollutant emissions and GHGs that contribute to climate change. | Public Health and Safety | N/A – best practice |
| PUB-21 | Solid and liquid wastes will be managed in accordance with applicable regulations to reduce the risk of spills, discharges, and accidental releases. | Public Health and Safety | USEPA and NJDEP |

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| **Applicant-Proposed Measures in the MMPA LOA Application, dated September 2022** | | | |
| LOA-1: PSO and PAM Operator training, experience, and responsibilities | • All PSOs and PAM Operators will have completed a PSO training course;<br>• The PSO field team and PAM team will have a lead observer (Lead PSO and PAM Lead) who will have experience in the northwestern Atlantic Ocean on similar projects as outlined in the Protected Species Management and Equipment Specifications Plan;<br>• Remaining PSOs and PAM operators will have previous experience on similar projects and the ability to work with relevant software and equipment;<br>• PSO and PAM Operators resumes will be provided to NMFS for review and approval prior to the start of activities;<br>• PSOs and PAM operators will complete a Permits and Environmental Compliance Plan training and a 2-day training and refresher session with the PSO provider and Project compliance representatives before the anticipated start of Project activities;<br>• PSOs will be employed by a third-party observer provider and will have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards); and<br>• Situational Awareness/Common Operating Picture and Coordination: Atlantic Shores will establish a situational awareness network for marine mammal and sea turtle detections through the integration of sighting communication tools such as Mysticetus, Whale Alert, WhaleMap, etc. This network will be monitored daily, and any sighting information will be made available to all project vessels. In addition, field personnel will:<br>○ Monitor the NMFS NARW reporting systems daily;<br>○ Monitor the USCG VHF Channel 16 throughout the day to receive notifications of any sighting; and<br>○ Monitor any existing real-time acoustic networks. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-2: Visual monitoring | • No individual PSO will work more than 4 consecutive hours without a 2-hour break or longer than 12 hours during a 24-hour period;<br>• Each PSO will be provided with one 8-hour break per 24-hour period to sleep;<br>• Observations will be conducted from the best available vantage point(s) on the vessels (stable, elevated platform from which PSOs have an unobstructed 360-degree view of the water);<br>• PSOs will systematically scan with the naked eye and a 7 x 50 reticle binocular, supplemented with night-vision equipment when needed. When monitoring at night or in low visibility conditions, PSOs will monitor for marine mammals and other protected species using night-vision goggles with thermal clip-ons, a hand-held spotlight, and/or a mounted thermal camera system;<br>• Activities with larger clearance zones will use 25 x 150 millimeter "big eye" binoculars; and<br>• Vessel personnel will be instructed to report any sightings to the PSO team as soon as they are able and it is safe to do so. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-3: Acoustic monitoring (WTG and OSS foundation installation only) | • Deployment of PAM system will be outside the perimeter of the shutdown zone (SZ); and<br>• PSOs will be given adequate breaks and will work no longer than 12 hours per day. | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-4: Vessel strike avoidance | Atlantic Shores will implement vessel strike avoidance measures including but not limited to the following except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk or when the vessel is restricted in its ability to maneuver. In addition to the Base Conditions for Vessel Strike Avoidance below, Atlantic Shores will implement a Standard Plan or an Adaptive Plan as presented below. These three plans are intended to be interchangeable and implemented throughout both the construction and operations phases of the Project. Atlantic Shores will submit a final NARW Vessel Strike Avoidance Plan. This plan will be provided to NMFS at least 90 days prior to commencement of vessel use and further details the Adaptive Plan and specific monitoring equipment to be used. The plan will, at a minimum, describe how PAM, in combination with visual observations, will be conducted to ensure the transit corridor is clear of NARWs. The plan will also provide details on the vessel-based observer protocols on transiting vessels.<br><u>General Operational Measures</u><br>• All personnel working offshore will receive training on marine mammal awareness and vessel strike avoidance measures;<br>• A vessel crew training program will be provided to NMFS for review and approval prior to the start of activities. All vessel crew members will be briefed in the identification of protected species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew members understand and will comply with the necessary requirements throughout activities offshore;<br>• Vessel personnel will maintain a vigilant watch for marine mammals and slow down or maneuver vessel as appropriate to avoid striking marine mammals; and<br>• When marine mammals are sighted while a vessel is underway, the vessel will 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).<br><u>Operational Separation Distances</u> | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |

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| | Vessels will maintain, to the extent practicable, separation distances of:<br>• Greater than 1,640 feet (500 meters) from any sighted NARW or unidentified large marine mammals;<br>• Greater than 328 feet (100 meters) from all other whales; and<br>• Greater than 164 feet (50 meters) for dolphins, porpoises, and seals.<br><u>Standard Vessel Avoidance Plan</u><br>• Implement Base Conditions as described above;<br>• Between November 1 and April 30: Vessels greater than or equal to 65 feet (19.8 meters) in overall length, excluding CTVs, will operate at 10 knots (18.5 kilometers per hour) or less between November 1 and April 30 while transiting to and from the Project area except while transiting areas which have not been demonstrated by best available science to provide consistent habitat for NARW. Vessels greater than or equal to 65 feet (19.8 meters) in overall length, including CTVs, will operate at 10 knots (18.5 kilometers per hour) or less when within any active Seasonal Management Area (SMA).<br>• Year Round: Vessels of all sizes will operate at 10 knots (18.5 kilometers per hour) or less in any Dynamic Management Areas (DMAs).<br>• Between May 1 and September 30: All underway vessels (transiting or surveying) operating at > 10 knots (18.5 kilometers per hour) will have a dedicated visual observer (or NMFS-approved automated visual detection system) 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 degrees starboard). Visual observers must be equipped with alternative monitoring technology for periods of low visibility (e.g., darkness, rain, fog, etc.).<br>• 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; and<br>• Visual observers may be third-party observers (i.e., NMFS-approved PSOs) or crew members.<br><u>Adaptive Vessel Avoidance Plan</u><br>Atlantic Shores will adhere to the Standard Plan outlined above except in cases where crew safety is at risk, and/or labor restrictions, vessel availability, costs to the project, or other unforeseen circumstance make these measures impracticable. To address these situations, an Adaptive Plan will be developed in consultation with NMFS to allow modification of speed restrictions for vessels. Should Atlantic Shores choose not to implement this Adaptive Plan or a component of the Adaptive Plan is offline (e.g., equipment technical issues), Atlantic Shores will default to the Standard Plan (described above). The Adaptive Plan will not apply to vessels greater than or equal to 65 feet (19.8 meters) in length subject to speed reductions in SMAs as designated by NOAA's Vessel Strike Reduction Rule.<br>• Year Round: A semi-permanent acoustic network comprising near real-time bottom mounted and/or mobile acoustic monitoring platforms will be installed year-round such that confirmed NARW detections are regularly transmitted to a central information portal and disseminated through the situational awareness network;<br>○ The transit corridor and Offshore Project areas will be divided into detection action zones;<br>○ Localized detections of NARW in an action zone would trigger a slow-down to 10 knots (18.5 kilometers per hour) or less in the respective zone for the following 12 hours. Each subsequent detection would trigger a 12-hour reset. A slow-down zone expires when there has been no further visual or acoustic detection in the past 12 hours within the triggered zone; and<br>○ The detection action zone's size will be defined based on efficacy of PAM equipment deployed and subject to NMFS approval as part of the NARW Vessel Strike Avoidance Plan.<br>• Year Round: All underway vessels (transiting or surveying) operating > 10 knots (18.5 kilometers per hour) will have a dedicated visual observer (or NMFS-approved automated visual detection system) 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 degrees starboard). Visual observers must be equipped with 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 third-party observers (i.e., NMFS-approved PSOs) or crew members;<br>• Year Round: If any DMA is established that overlaps with an area where a project vessel would operate, that vessel, regardless of size when entering the DMA, may transit that area at a speed of 10 knots (18.5 kilometers per hour) or less. Any active action zones within the DMAs may trigger a slow down as described above; and<br>• If PAM and/or thermal systems are offline, the Standard Vessel Avoidance Plan measures will apply for the respective zone (where PAM is offline) or vessel (if automated visual systems are offline). | | |
| LOA-5: Data recording | • All data will be recorded using industry-standard software, and or standardized data forms, whether hard copy or electronic; and<br>• Data recorded will include information related to ongoing operations, observation methods and effort, visibility conditions, marine mammal detections (e.g., species, age classification [if known], numbers, behavior), and any mitigation actions requested and enacted. | Marine Mammals | BOEM, BSEE, and NMFS |

<table>
<tr><th>Measure Number/Name</th><th>Description of Applicant-Proposed Environmental Protection Measures</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[1]</th></tr>
<tr><td>LOA-6: Reporting</td><td>The following situations would require immediate reporting to appropriate POCs:<ul><li>If a stranded, entangled, injured, or dead marine mammal or protected species is observed, the sighting will be reported within 24 hours to the NMFS SAS hotline;</li><li>If a protected species is injured or killed as a result of Project activities, the vessel captain or PSO on board will report immediately to NMFS Office of Protected Resources and Greater Atlantic Regional Fisheries Office no later than within 24 hours; and</li><li>Any NARW sightings will be reported as soon as feasible and no later than within 24 hours to the NMFS SAS hotline or via the WhaleAlert Application.</li></ul>Data and Final Reports will be prepared using the following protocols:<ul><li>All vessels will utilize a standardized data entry format;</li><li>A database of all sightings and associated details (e.g., distance from vessel, behavior, species, group, size/composition) within and outside of the designated SZs, monitoring effort, environmental conditions, and Project-related activity will be provided after field operations and reporting are complete. This database will undergo thorough quality checks and include all variables required by the NMFS-issued Incidental Take Authorization (ITA) and BOEM Lease OCS-A 0499 and will be required for the Final Technical Report due to BOEM and NMFS;</li><li>During construction, weekly reports briefly summarizing sightings, detections, and activities will be provided to NMFS and BOEM on the immediate Wednesday following a Sunday-Saturday period;</li><li>Final reports will follow a standardized format for PSO reporting from activities requiring marine mammal mitigation and monitoring; and</li><li>An annual report summarizing the prior year's activities will be provided to NMFS and to BOEM on April 1 every calendar year summarizing the prior year's activities.</li></ul></td><td>Marine Mammals</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>LOA-7: WTG and OSS foundation installation – Visual monitoring</td><td><ul><li>There will be six to eight visual PSOs and PAM operators on the impact pile driving vessel and six to eight visual PSOs and PAM operators on any secondary marine mammal monitoring vessel; and</li><li>Two visual PSOs will be on watch on each construction and secondary vessel during pre-start clearance, throughout impact pile driving, and 30 minutes after piling is completed.</li></ul></td><td>Marine Mammals, Sea Turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>LOA-8: WTG and OSS foundation installation – Daytime visual monitoring</td><td><ul><li>PSOs will monitor for 30 minutes before and after each piling event;</li><li>Two PSOs will monitor the SZ with the naked eye and reticle binoculars while one PSO periodically scans outside the SZ using the mounted big eye binoculars; and</li><li>The secondary vessel, if used, will be positioned and circling at the outer limit of the Large Whale SZ.</li></ul></td><td>Marine Mammals, Sea Turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>LOA-9: WTG and OSS foundation installation – Daytime periods of reduced visibility</td><td><ul><li>If the clearance zone is obscured, the two PSOs on watch will continue to monitor the SZ using thermal camera systems and handheld night-vision devices (NVDs) as able; and</li><li>All PSOs on duty will be in contact with the on-duty PAM operator who will monitor the PAM systems for acoustic detections of marine mammals that are vocalizing in the area.</li></ul></td><td>Marine Mammals,<br>Sea Turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>LOA-10: WTG and OSS foundation installation – Nighttime visual: Construction and secondary vessel</td><td><ul><li>Visual PSOs will rotate in pairs: one observing with an NVD and one monitoring the infrared (IR) thermal imaging camera system; and</li><li>Deck lights will be extinguished or dimmed during night observations when using NVDs; however, if the deck lights must remain on for safety reasons, the PSO will attempt to use the NVDs in areas away from potential interference by these lights. If a PSO is still unable to monitor the required visual zones piling would not occur.</li></ul></td><td>Marine Mammals, Sea Turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>LOA-11: WTG and OSS foundation installation – Acoustic monitoring</td><td><ul><li>PAM operator will monitor during all pre-start clearance periods, piling, and post-piling monitoring periods (daylight, reduced visibility, and nighttime monitoring);</li><li>One PAM operator on duty during both daytime and nighttime/low visibility monitoring;</li><li>Real-time PAM systems require at least one PAM operator to monitor each system by viewing data or data products that are streamed in real-time or near real-time to a computer workstation and monitor located on a Project vessel or onshore; and</li><li>PAM operator will inform the PSOs on duty of animal detections approaching or within applicable ranges of interest to the pile-driving activity.</li></ul></td><td>Marine Mammals</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>LOA-12: WTG and OSS foundation installation – Shutdown zones</td><td>Atlantic shores will establish clearance and shutdown zones as identified in the table below.
<table>
<tr><th>Taxon</th><th>Clearance Zone (m)</th><th>Shutdown Zone (m)</th></tr>
<tr><td>NARW</td><td>1,900</td><td>1,900</td></tr>
<tr><td>Large whales</td><td>1,900</td><td>1,900</td></tr>
<tr><td>Delphinids</td><td>1,900</td><td>NSD</td></tr>
<tr><td>Harbor porpoise</td><td>1,900</td><td>1,480</td></tr>
<tr><td>Seals</td><td>1,900</td><td>320</td></tr>
</table></td><td>Marine Mammals, Sea Turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
</table>

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
|---|---|---|---|
| | Sea turtles 1,900 100 | | |
| LOA-13: WTG and OSS foundation installation – Pre-start clearance | • Piling may be initiated any time within a 24-hour period;<br>• Prior to the beginning of each pile driving event, PSOs and PAM operators will monitor for marine mammals for a minimum of 30 minutes and continue at all times during pile driving;<br>• All clearance zones will be confirmed to be free of marine mammals prior to initiating ramp-up, and the large whale clearance zones will be fully visible and the NARW acoustic zone monitored for the least 30 minutes prior to commencing ramp-up.<br>• If a marine mammal is observed entering or within the relevant clearance zones prior to the initiation of pile-driving activity, pile-driving activity will be delayed and will not begin until either the marine mammal(s) has voluntarily left the respective clearance zones and been visually or acoustically confirmed beyond the clearance zone, or, when the additional time period has elapsed with no further sighting or acoustic detection (i.e., 15 minutes for small odontocetes and 30 minutes for all other species). | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-14: WTG and OSS foundation installation – Ramp up (Soft start) | • Each monopile installation will begin with a minimum of 20-minute soft-start procedure as technically feasible;<br>• Soft-start procedure will not begin until the clearance zones have been cleared by the visual PSO or PAM operators; and<br>• If a marine mammal is detected within or about to enter the applicable clearance zones, prior to or during the soft-start procedure, pile driving will be delayed until the animal has been observed exiting the clearance zones or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes and 30 minutes for all other species). | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, BSEE, and NMFS |
| LOA-15: WTG and OSS foundation installation – Shutdowns | • If a marine mammal is detected entering or within the respective SZs after pile driving has commenced, an immediate shutdown of pile driving will be implemented unless Atlantic Shores determines shutdown is not feasible due to an imminent risk of injury or loss of life to an individual;<br>• If shutdown is called for but it is determined that shutdown is not feasible due to risk of injury or loss of life, there will be a reduction of hammer energy;<br>• Following shutdown, pile driving will only be initiated once all SZs are confirmed by PSOs to be clear of marine mammals for the minimum species-specific time periods;<br>• The SZ will be continually monitored by PSOs and PAM during any pauses in pile driving; and<br>• If a marine mammal is sighted within the SZ during a pause in piling, piling will be delayed until the animal(s) has moved outside the SZ and no marine mammals are sighted for a period of 30 minutes. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-16: WTG and OSS foundation installation – Post-piling monitoring | PSOs will continue to survey the clearance zone throughout the duration of pile installation and for a minimum of 30 minutes after piling has been completed. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-17: WTG and OSS foundation installation – Noise attenuation | Atlantic shores will use an NAS for all impact piling events and is committed to achieving 10 dB of noise attenuation. The type and number of NAS to be used during construction have not yet been determined but will consist of a single bubble curtain paired with an additional sound attenuation device or a double big bubble curtain. Based on prior measurements, this combination of NAS is reasonably expected to achieve greater than 10 dB broadband attenuation of impact pile driving sounds. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-18: WTG and OSS foundation installation – Sound measurements | • Measurements of the installation of at one WTG and one OSS foundation installation will be made. If different piled foundation types are selected for the WTGs and/or OSSs between Projects 1 and 2, sound field verification will be conducted for at least one foundation of each piled type. Results of sound field verification will be used to modify SZs, as appropriate; and<br>• For each foundation installation measured, Atlantic Shores will estimate ranges to Level A and Level B harassment isopleths by extrapolating from in-situ measurements at multiple distances from the foundation including at least one measurement location at the most conservative distance for the shutdown zone and the clearance zone. | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-19: HRG surveys – Visual monitoring | • Four to six PSOs on all 24-hour survey vessels;<br>• Two to three PSOs on all 12-hour survey vessels; and<br>• The PSOs will begin observation of the SZs prior to initiation of HRG survey operations and will continue throughout survey activity and/or while equipment operating below 180 kHz is in use. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-20: HRG surveys – Daytime visual monitoring | • One PSO on watch during all pre-clearance periods and source operations; and<br>• PSOs will use reticule binoculars and the naked eye to scan the clearance zone for marine mammals. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-21: HRG surveys – Nighttime and low visibility visual observations | • The lead PSO will determine if conditions warrant implementing reduced visibility protocols;<br>• Two PSOs on watch during all pre-clearance periods and operations; and | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
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| | • Each PSO will use the most appropriate available technology (e.g., IR camera and NVD) and viewing locations to monitor the SZs and maintain vessel separation distances | | |
| LOA-22: HRG surveys – Shutdown zones for HRG surveys | Atlantic Shores will establish shutdown zones as follows:<br>• NARW: 1,640 feet (500 meters);<br>• All other marine mammals: 328 feet (100 meters); and<br>• Certain *Delphinus*, *Lagenorhynchus*, *Stenella*, or *Tursiops* that are visually detected as voluntarily approaching the vessel or towed equipment: No SZ | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-23: HRG surveys – Pre-start clearance | • Prior to the initiation of equipment ramp-up, PSO and PAM operators will conduct a 30-minute watch of the clearance zones to monitor for marine mammals;<br>• The clearance zones must be visible using the naked eye or appropriate visual technology during the entire clearance period for operations to start; if the clearance zones are not visible, source operations < 180 kHz will not commence; and<br>• If a marine mammal is observed within its respective clearance zone during pre-clearance period, ramp-up will not begin until the animal(s) has been observed exiting its respective clearance zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes and 30 minutes for all other species). | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-24: HRG surveys – Ramp up (Soft start) | • Ramp-up will not be initiated during periods of inclement conditions or if the clearance zones cannot be adequately monitored by the PSOs, using the appropriate visual technology for a 30-minute period;<br>• Ramp-up will begin by powering up the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey followed by a gradual increase and addition of other acoustic sources (as able);<br>• If a marine mammal is detected within or about to enter its respective clearance zone, ramp-up will be delayed; and<br>• Ramp-up will continue once the animal has been observed exiting its respective clearance zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes and 30 minutes for all other species). | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, BSEE, and NMFS |
| LOA-25: HRG surveys – Shutdowns | • Shutdown of impulsive, non-parametric HRG survey equipment other than CHIRP sub-bottom profilers operating at frequencies < 180 kHz is required if a marine mammal is sighted at or within its respective SZ;<br>• Shutdowns will not be implemented for dolphins that voluntarily approach the survey vessel;<br>• Subsequent restart of the survey equipment will be initiated using the same procedure described above during pre-start clearance;<br>• If the acoustic source is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, it will be reactivated without ramp-up if PSOs have maintained constant observation and no detections of any marine mammal have occurred within the respective SZs; and<br>• If the acoustic source is shut down for a period longer than 30 minutes or PSOs were unable to maintain constant observation, then ramp-up and pre-start clearance procedures will be initiated. | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-26: Cofferdam installation and removal – Visual monitoring | • All observations will take place from one of the construction vessels stationed at or near the vibratory piling location;<br>• Two PSOs on duty on the construction vessel; and<br>• PSOs will continue to survey the SZ using visual protocols throughout the installation of each cofferdam sheet pile and for a minimum of 30 minutes after piling has been completed. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-27: Cofferdam installation and removal – Daytime visual monitoring | • Two PSOs will maintain watch during the pre-start clearance period, throughout vibratory pile driving, and 30 minutes after piling is completed;<br>• Two PSOs will conduct observations concurrently; and<br>• One observer will monitor the SZ with the naked eye and reticule binoculars; one PSO will monitor in the same way but will periodically scan outside the SZ. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-28: Cofferdam installation and removal – Daytime visual monitoring during periods of low visibility | One PSO will monitor the SZ with the mounted IR camera while the other maintains visual watch with the naked eye/binoculars. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-29: Cofferdam installation and removal – Shutdown zones | The following shutdown zones will be enacted during vibratory piling if safe and technically feasible to do so:<br>• Large whales (baleen whales including NARW + sperm whales): 328 feet (100 meters);<br>• Mid-frequency cetaceans, excluding sperm whales: 164 feet (50 meters);<br>• Harbor porpoise (high-frequency cetacean): 492 feet (150 meters); and<br>• Seals: 197 feet (60 meters). | Marine Mammals | BOEM, BSEE, and NMFS |
| LOA-30: Cofferdam installation and removal – Pre-start clearance | • PSOs will monitor the clearance zone for 30 minutes prior to the start of vibratory pile driving; and<br>• If a marine mammal is observed entering or within the respective clearance zones piling cannot commence until the animal has exited the clearance zone or time has elapsed since the last sighting (30 minutes for large whales, 15 minutes for dolphins, porpoises, and pinnipeds). | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |

| Measure Number/Name | Description of Applicant-Proposed Environmental Protection Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency[1] |
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| LOA-31: Cofferdam installation and removal – Ramp up (Soft start) | Ramp-up (a slow increase in power repeated three times) will be initiated if the clearance zone cannot be adequately monitored (i.e., obscured by fog, inclement weather, poor lighting conditions) for a 30-minute period. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| LOA-32: Cofferdam installation and removal – Shutdowns | • If a marine mammal is observed entering or within the respective SZs after sheet pile installation has commenced, a shutdown will be implemented; and<br>• The SZ must be continually monitored by PSOs during any pauses in vibratory pile driving; activities will be delayed until the animal(s) has moved outside the SZ and no marine mammals are sighted for a period of 15 minutes (small cetaceans and pinnipeds) or 30 minutes (large cetaceans and deep divers). | Marine Mammals | BOEM, BSEE, and NMFS |

**Table G-2. Mitigation and monitoring measures resulting from consultations**

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
|---|---|---|---|---|---|
| **BOEM-Proposed Mitigation and Monitoring Measures in the NMFS BA (December 2023)** | | | | | |
| 1 | C, O&M | Incorporate LOA requirements | The measures required by the final MMPA LOA would be incorporated by reference where appropriate into COP approval, and BOEM and/or BSEE would monitor compliance with these measures. | Marine Mammals | BOEM, BSEE, and NMFS |
| 2 | O&M, D | Vessel strike avoidance for marine mammals and sea turtles | The Lessee must continue to implement vessel strike avoidance measures to include the identified vessel speed restrictions and minimum separation distances for crew transfer vessels agreed to in the Applicant-proposed measures (Table G-1, Measure # LOA-4). | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| 3 | Pre-C, C, O&M, D | Marine debris awareness training | The Lessee would ensure that vessel operators, employees, and contractors engaged in offshore activities pursuant to the approved COP complete marine trash and debris awareness training annually. The training consists of two parts: (1) viewing a marine trash and debris training video or slide show (described below); and (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements. The marine trash and debris training videos, training slide packs, and other marine debris related educational material may be obtained at https://www.bsee.gov/debris or by contacting BSEE. The training videos, slides, and related material may be downloaded directly from the website. Operators engaged in marine survey activities would continue to develop and use a marine trash and debris awareness training and certification process that reasonably assures that their employees and contractors are in fact trained. The training process would include the following elements:<br>• Viewing of either a video or slide show by the personnel specified above;<br>• An explanation from management personnel that emphasizes their commitment to the requirements;<br>• Attendance measures (initial and annual); and<br>• Recordkeeping and the availability of records for inspection by DOI.<br>By January 31 of each year, the Lessee would submit to DOI an annual report that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year. The Lessee would send the reports via email to BOEM (at renewable_reporting@boem.gov) and to BSEE (at marinedebris@bsee.gov). | Multiple | BOEM, BSEE, and NMFS |
| 4 | C, O&M | Passive Acoustic Monitoring (PAM) Plan | BOEM and USACE would ensure that the Lessee prepares a PAM Plan that describes all proposed equipment, deployment locations, detection review methodology and other procedures, and protocols related to the proposed uses of PAM for mitigation and long-term monitoring. This plan would be submitted to NMFS and BOEM for review and concurrence at least 120 days prior to the planned start of activities requiring PAM. | Marine Mammals, ESA-listed Fish | BOEM, USACE, BSEE, and NMFS |
| 5 | C | Pile Driving Monitoring Plan | BOEM would ensure that the Lessee prepares and submits a *Pile Driving Monitoring Plan* to NMFS for review and concurrence at least 90 days before start of pile driving. The plan would detail all plans and procedures for sound attenuation as well as for monitoring ESA-listed whales and sea turtles during all impact and vibratory pile driving. The plan would also describe how BOEM and the Lessee would determine the number of whales exposed to noise above the Level B harassment threshold during pile driving with the vibratory hammer to install the cofferdam at the sea-to-shore transition. The Lessee would obtain NMFS' concurrence with this plan prior to starting any pile driving. | Marine Mammals, Sea Turtles | BOEM and NMFS |
| 6 | C | PSO coverage | BOEM and USACE would ensure that PSO coverage is sufficient to reliably detect marine mammals and sea turtles at the surface in clearance and shutdown zones to execute any pile driving delays or shutdown requirements during foundation installation. This will include a PSO/PAM team on the construction vessel and two additional PSO vessels each with a visual monitoring team. The following equipment and personnel will be on each associated vessel.<br><u>Construction Vessel:</u><br>• 2—visual PSOs on watch;<br>• 2—reticle binoculars (7x or 10x) calibrated for observer height off the water;<br>• 2—"big eye" binoculars (25x or similar) mounted 180° apart if vessel is deemed appropriate to provide a platform in which use of the big eye binoculars would be effective;<br>• 2—handheld or wearable night vision devices with infrared spotlights;<br>• 1—mounted thermal/infrared camera system;<br>• 1—digital single-lens reflex camera equipped with a 300-millimeter lens;<br>• 2—PSO-dedicated VHF radios;<br>• 1—PAM operator on duty; | Marine Mammals, Sea Turtles | BOEM and NMFS |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
|---|---|---|---|---|---|
| | | | • 1—monitoring station for real-time PAM system; and<br>• 1—data collection software system.<br><u>Each Additional PSO Vessel (2):</u><br>• 2—visual PSOs on watch;<br>• 2—reticle binoculars (7x or 10x) calibrated for observer height off the water;<br>• 1—mounted "big eye" binoculars (25x or similar) if vessel is deemed appropriate to provide a platform in which use of the big eye binoculars would be effective;<br>• 1—handheld or wearable night vision device with infrared spotlight;<br>• 1—mounted thermal/IR camera system;<br>• 1—digital single lens reflex camera equipped with a 300-mm lens;<br>• 2—PSO-dedicated VHF radios; and<br>• 1—data collection software system.<br>If, at any point prior to or during construction, the PSO coverage that is included as part of the Proposed Action is determined not to be sufficient to reliably detect ESA-listed whales and sea turtles within the clearance and shutdown zones, additional PSOs and/or platforms would be deployed. Determinations prior to construction would be based on review of the *Pile Driving Monitoring Plan*. Determinations during construction would be based on review of the weekly pile-driving reports and other information, as appropriate. | | |
| 7 | C | Sound field verification | Applicant-proposed measures plus:<br>BOEM and USACE would ensure that if the clearance and/or shutdown zones are expanded due to the verification of sound fields from Project activities, PSO coverage is sufficient to reliably monitor the expanded clearance and/or shutdown zones. Additional observers would be deployed on additional platforms for every 4,921 feet (1,500 meters) that a clearance or shutdown zone is expanded beyond the distances modeled prior to verification. | Marine Mammals, Sea Turtles | BOEM and NMFS |
| 8 | C | Adaptive shutdown zones | BOEM and USACE may consider reductions in the SZs for ESA-listed sei, fin, or sperm whales based upon thorough sound field verification of a minimum of three piles. Sound field verification of additional piles may be required based on results of actual measurements. However, BOEM/USACE would ensure that the SZ for sei, fin, and sperm whales is not reduced to less than 3,280 feet (1,000 meters), or 1,640 feet (500 meters) for ESA-listed sea turtles. No reductions in the clearance or SZs for NARWs would be considered regardless of the results of sound field verification of a minimum of three piles. | Marine Mammals, Sea Turtles | BOEM, USACE, BSEE and NMFS |
| 9 | C | Monitoring zone for sea turtles | BOEM and USACE would ensure that the Lessee monitors the full extent of the area where noise would exceed the 175 dB RMS threshold for ESA-listed sea turtles for the full duration of all pile-driving activities and for 30 minutes following the cessation of pile driving activities and record all observations in order to ensure that all take that occurs is documented. | Sea Turtles | BOEM and NMFS |
| 10 | Pre-C, C, O&M, D | Look out for sea turtles and reporting | a. For all vessels operating north of the Virginia/North Carolina border, between June 1 and November 30, the Lessee would have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles. The trained lookout would communicate any sightings, in real time, to the captain so that the requirements in (e) below can be implemented.<br>b. For all vessels operating south of the Virginia/North Carolina border, year-round, the Lessee would have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles. The trained lookout would communicate any sightings, in real time, to the captain so that the requirements (e) below can be implemented. This requirement would be in place year-round for any vessels transiting south of Virginia, as sea turtles are present year-round in those waters.<br>c. The trained lookout would monitor https://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.<br>d. The trained lookout would maintain a vigilant watch and monitor a 1,640-foot (500-meter) Vessel Strike Avoidance Zone at all times to minimize potential vessel strikes of ESA-listed sea turtle species. Alternative monitoring technology (e.g., infrared spotlight in combination with night vision, thermal cameras, etc.) would be available to ensure effective watch at night and in any other low visibility conditions. If the trained lookout is a vessel crew member, this would be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts would receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. | Sea Turtles | BOEM and NMFS |

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| | | | e. If a sea turtle is sighted within 328 feet (100 meters) or less of the operating vessel's forward path, the vessel operator would slow down to 4 knots (7 kilometers per hour) (unless unsafe to do so) and then proceed away from the turtle at a speed of 4 knots (7 kilometers per hour) or less until there is a separation distance of at least 328 feet (100 meters) at which time the vessel may resume normal operations. If a sea turtle is sighted within 164 feet (50 meters) of the forward path of the operating vessel, the vessel operator would shift to neutral when safe to do so and then proceed away from the turtle at a speed of 4 knots (7 kilometers per hour). The vessel may resume normal operations once it has passed the turtle.<br>f. Vessel captains/operators would avoid transiting through areas of visible jellyfish aggregations or floating sargassum lines or mats. In the event that operational safety prevents avoidance of such areas, vessels would slow to 4 knots (7 kilometers per hour) while transiting through such areas.<br>g. All vessel crew members would be briefed in the identification of sea turtles and in regulations and best practices for avoiding vessel collisions. Reference materials would be available aboard all Project vessels for identification of sea turtles. The expectation and process for reporting of sea turtles (including live, entangled, and dead individuals) would be clearly communicated and posted in highly visible locations aboard all Project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so.<br>h. The only exception is when the safety of the vessel or crew necessitates deviation from these requirements on an emergency basis. If any such incidents occur, they must be reported to NMFS within 24 hours.<br>i. If a vessel is carrying a PSO or trained lookout for the purposes of maintaining watch for NARWs, an additional lookout is not required, and this PSO or trained lookout must maintain watch for whales and sea turtles.<br>j. Vessel transits to and from the Wind Farm Area, that require PSOs will maintain a speed commensurate with weather conditions and effectively detecting sea turtles prior to reaching the 328-foot (100-meter) avoidance measure. | | |
| 11 | C | Vessel strike avoidance for Rice's whale | For vessels operating in the Gulf of Mexico, the Lessee shall ensure that vessel operators and crews associated with the Proposed Action are aware of the presence of Rice's whale in the Gulf of Mexico. Rice's whales are protected under the Endangered Species Act of 1973 and the Marine Mammal Protection Act of 1972. All Project vessels transiting the Gulf of Mexico must comply with the Rice's whale mitigation measures outlined below. If a whale is observed in the Gulf of Mexico and cannot be confirmed to be a species other than a Rice's whale, the vessel operator and crew must assume the whale is a Rice's whale and comply with mitigation requirements accordingly.<br>a. All vessels associated with the Proposed Action must have a least one dedicated visual observer on duty during daylight hours who is responsible for keeping watch for Rice's whales and ensuring compliance with Rice's whale mitigation measures, as detailed below. Visual observers may be third-party observers (i.e., PSOs) or crew members. Visual observers must have sufficient training to distinguish marine mammals from other phenomena and broadly to identify a marine mammal as a Rice's whale, other whale (defined in this context as sperm whales or baleen whales other than Rice's whales), or other marine mammal.<br>b. All Project vessels must maintain a minimum separation distance of 546 yards (500 meters) from Rice's whales. If a Rice's whale is sighted within 546 yards (500 meters) of a vessel, the vessel must slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid a vessel strike. All known or suspected collisions with Rice's whales or other whales must be reported immediately by calling 1-877-WHALE-HELP.<br>c. If a Rice's whale (and any other whales that may be Rice's whales) is observed at any time by PSOs or Project personnel, the Lessee, or their contractors, must immediately (if not feasible, as soon as possible and no longer than 24 hours after the sighting) report sighting information to NMFS by calling 1-877-WHALE-HELP.<br>i. If calling the hotline is not possible, sighting reports should be submitted to nmfs.ser.re.sightings@noaa.gov.<br>ii. The sighting report should include the time, date, and location (latitude/longitude) of the sighting, number of whales, animal description/certainty of sighting (provide photos/video if taken), lease area/project name, PSO/personnel name, PSO provider company (if applicable), and contact info.<br>iii. All sighting reports must also be submitted to renewable_reporting@boem.gov and protectedspecies@bsee.gov.<br>d. All vessels associated with the Proposed Action must be equipped with a functioning Automatic Identification System (AIS) that is operational and actively transmitting. All static data (e.g., vessel MMSI number, name, vessel type) and voyage related data (e.g., navigational status, static draft, destination) must be entered into AIS accurately. AIS is required to monitor the number of vessels and traffic patterns for analysis and compliance with vessel speed requirements and to make | Marine Mammals | BOEM, BSEE, and NMFS |

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| | | | identification of infrastructure easier for non-Project vessels. The Lessee must submit to BOEM a report with the AIS data at the time it submits the certification of compliance required under 30 CFR §585.633(b).<br><u>Additional Requirements within the 328 to 1,312-Foot (100 to 400 Meter) Isobath</u><br>Project vessels operating in the 328 to 1,312-foot (100 to 400-meter) isobath within the Gulf of Mexico must comply with requirements a through d above, as well as the following additional requirements:<br>a. All vessels associated with the Proposed Action are strongly encouraged to minimize transit distance within the 328 to 1,312-foot (100 to 400-meter) isobath.<br>b. All vessels, regardless of size, must observe a 10-knot or less year-round speed restriction at all times when transiting through the 328 to 1,312-foot (100 to 400-meter) isobath. The only exception to the 10-knot vessel speed restriction would be when the safety of the vessel or crew is in doubt or the safety of the life at sea is in question.<br><u>Additional Requirements within the Rice's Whale Core Distribution Area (CDA)</u><br>Project vessels operating in the Rice's whale CDA within the Gulf of Mexico must comply with requirements a through d above, as well as the following additional requirements:<br>a. All vessels associated with the Proposed Action should avoid transit in the Rice's whale CDA.<br>b. If transiting within the Rice's whale CDA cannot be avoided, all vessels, regardless of size, must observe a 10-knot or less, year-round speed restriction during daylight hours. The only exception to the 10-knot vessel speed restriction would be when the safety of the vessel or crew is in doubt of the safety of life at sea is in question.<br>c. Vessel transit through the CDA is not permitted at nighttime or in low visibility conditions (e.g., fog, surface winds greater than 11 knots, average wave height greater than 3 feet) except for emergencies when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.<br>d. If an operator deviates from these conditions/protocols, a record of said noncompliance must be generated and include the following information: the lease number; vessel name; automatic identification system (AIS) ID; environmental conditions, including Beaufort scale (wind speed/wave height) and any other relevant weather conditions, including cloud cover, fog, sun glare, and overall visibility on the horizon; deviations and reasons for exceeding speed restrictions; deviations and reasons for transit through the CDA at nighttime or in low visibility conditions; all interactions with Rice's whales and/or approaches within 546 yards (500 meters). Additionally, all "sighting report(s)" associated with the transit must be appended to the Transit Report. The Lessee must submit the Transit Report(s) to renewable_reporting@boem.gov, protectedspecies@bsee.gov, and nmfs.ser.rw.sightings@noaa.gov within 24 hours of transit through the Rice's whale CDA. The subject of the email should include "Transit through Rice's Whale CDA." | | |
| 12 | All fisheries surveys | Sampling gear | All sampling gear would be hauled at least once every 30 days, and all gear would be removed from the water and stored on land between survey seasons to minimize risk of entanglement. | Marine Mammals, Sea Turtles, ESA-listed Fish | NMFS and NJDEP |
| 13 | Pot/trap surveys | Gear identification | To facilitate identification of gear on any entangled animals, all trap/pot gear used in the surveys would be uniquely marked to distinguish it from other commercial or recreational gear. Using yellow and black striped duct tape, place a 3-foot-long (0.9-meter-long) mark within 2 fathoms of a buoy. In addition, using black and white paint or duct tape, place three additional marks on the top, middle and bottom of the line. These gear marking colors are proposed as they are not gear markings used in other fisheries and are therefore distinct. Any changes in marking would not be made without notification and approval from NMFS. | Marine Mammals, Sea Turtles, ESA-listed Fish | NMFS and NJDEP |
| 14 | All fisheries surveys | Lost survey gear | If any survey gear is lost, all reasonable efforts that do not compromise human safety would be undertaken to recover the gear. All lost gear would be reported to NMFS (nmfs.gar.incidental-take@noaa.gov) within 24 hours of the documented time of missing or lost gear. This report would include information on any markings on the gear and any efforts undertaken or planned to recover the gear. | Marine Mammals, Sea Turtles, ESA-listed Fish | NMFS and NJDEP |
| 15 | Trawl and ventless trap surveys | Survey training | At least one of the survey staff onboard the trawl surveys and ventless trap surveys would have completed Northeast Fisheries Observer Program observer training (within the last 5 years) or other training in protected species identification and safe handling (inclusive of taking genetic samples from Atlantic sturgeon). Reference materials for identification, disentanglement, safe handling, and genetic sampling procedures would be available on board each survey vessel. BOEM would ensure that the Lessee prepares a training plan that addresses how this requirement would be met and that the plan is submitted to NMFS in advance of any trawl or trap surveys. This requirement is in place for any trips where gear is set or hauled. | Sea Turtles, ESA-listed Fish | NMFS and NJDEP |
| 16 | Pot/trap surveys | Sea turtle disentanglement | Vessels deploying fixed gear (e.g., pots/traps) would have adequate disentanglement equipment (i.e., knife and boathook) onboard. Any disentanglement would occur consistent with the Northeast Atlantic Coast Sea Turtle Disentanglement Network Disentanglement Guidelines at https://www.reginfo.gov/public/do/DownloadDocument?objectID=102486501 and the | Sea Turtles | NMFS and NJDEP |

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| | | | procedures described in "Careful Release Protocols for Sea Turtle Release with Minimal Injury" (NOAA Technical Memorandum 580; https://repository.library.noaa.gov/view/noaa/3773). | | |
| 17 | All fisheries surveys | Sea turtle/ Atlantic sturgeon identification and data collection | Any sea turtles or Atlantic sturgeon caught and/or retrieved in any fisheries survey gear would first be identified to species or species group. Each ESA-listed species caught and/or retrieved would then be properly documented using appropriate equipment and data collection forms. Biological data, samples, and tagging would occur as outlined below. Live, uninjured animals should be returned to the water as quickly as possible after completing the required handling and documentation.<br>a. The Sturgeon and Sea Turtle Take Standard Operating Procedures would be followed (https://media.fisheries.noaa.gov/2021-11/Sturgeon%20%26%20Sea%20Turtle%20Take%20SOPs_external_11032021.pdf).<br>b. Survey vessels would have a passive integrated transponder (PIT) tag reader onboard capable of reading 134.2 kHz and 125 kHz encrypted tags (e.g., Biomark GPR Plus Handheld PIT Tag Reader) and this reader would be used to scan any captured sea turtles and sturgeon for tags. Any recorded tags would be recorded on the take reporting form (see below).<br>c. Genetic samples would be taken from all captured Atlantic sturgeon (alive or dead) to allow for identification of the distinct population segment (DPS) of origin of captured individuals and tracking of the amount of incidental take. This would be done in accordance with the Procedures for Obtaining Sturgeon Fin Clips (https://media.fisheries.noaa.gov/2021-11/Sturgeon%20%26%20Sea%20Turtle%20Take%20SOPs_external_11032021.pdf).<br>i. Fin clips would be sent to an NMFS-approved laboratory capable of performing genetic analysis and assignment to DPS of origin. To the extent authorized by law, BOEM is responsible for the cost of the genetic analysis. Arrangements would be made for shipping and analysis in advance of submission of any samples; these arrangements would be confirmed in writing to NMFS within 60 days of the receipt of the Project Biological Opinion with ITS. Results of genetic analysis, including assigned DPS of origin would be submitted to NMFS within 6 months of the sample collection.<br>ii. Subsamples of all fin clips and accompanying metadata forms would be held and submitted to a tissue repository (e.g., the Atlantic Coast Sturgeon Tissue Research Repository) on a quarterly basis. The Sturgeon Genetic Sample Submission Form is available for download at: https://media.fisheries.noaa.gov/2021-02/Sturgeon%20Genetic%20Sample%20Submission%20sheet%20for%20S7_v1.1_Form%20to%20Use.xlsx?nullhttps://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic.<br>d. All captured sea turtles and Atlantic sturgeon would be documented with required measurements and photographs. The animal's condition and any marks or injuries would be described. This information would be entered as part of the record for each incidental take. An NMFS Take Report Form would be filled out for each individual sturgeon and sea turtle (download at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null) and submitted to NMFS as described in the take notification measure below. | Sea Turtles, ESA-listed Fish | NMFS and NJDEP |
| 18 | All fisheries surveys | Sea turtle/Atlantic sturgeon handling and resuscitation guidelines | Any sea turtles or Atlantic sturgeon caught and retrieved in gear used in fisheries surveys would be handled and resuscitated (if unresponsive) according to established protocols and whenever at-sea conditions are safe for those handling and resuscitating the animal(s) to do so. Specifically:<br>a. Priority would be given to the handling and resuscitation of any sea turtles or sturgeon that are captured in the gear being used, if conditions at sea are safe to do so. Handling times for these species should be minimized (i.e., kept to 15 minutes or less) to limit the amount of stress placed on the animals.<br>b. All survey vessels would have copies of the sea turtle handling and resuscitation requirements found at 50 CFR 223.206(d)(1) prior to the commencement of any on-water activity (download at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null). These handling and resuscitation procedures would be carried out any time a sea turtle is incidentally captured and brought onboard the vessel during the Proposed Action.<br>c. If any sea turtles that appear injured, sick, or distressed are caught and retrieved in fisheries survey gear, survey staff would immediately contact the Greater Atlantic Region Marine Animal Hotline at 866-755-6622 for further instructions and guidance on handling the animal, and potential coordination of transfer to a rehabilitation facility. If unable to contact the hotline (e.g., due to distance from shore or lack of ability to communicate via phone), USCG should be contacted via VHF marine radio on Channel 16. If required, hard-shelled sea turtles (i.e., non-leatherbacks) may be held on board for up to 24 hours following handling instructions provided by the Hotline, prior to transfer to a rehabilitation facility.<br>d. Attempts would be made to resuscitate any Atlantic sturgeon that are unresponsive or comatose by providing a running source of water over the gills as described in the Sturgeon Resuscitation Guidelines (https://media.fisheries.noaa.gov/dam-migration/sturgeon_resuscitation_card_06122020_508.pdf). | Sea Turtles, ESA-listed Fish | NMFS and NJDEP |

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| | | | e. Provided that appropriate cold storage facilities are available on the survey vessel, following the report of a dead sea turtle or sturgeon to NMFS, and if NMFS requests, any dead sea turtle or Atlantic sturgeon would be retained on board the survey vessel for transfer to an appropriately permitted partner or facility on shore as safe to do so.<br>f. Any live sea turtles or Atlantic sturgeon caught and retrieved in gear used in any fisheries survey would ultimately be released according to established protocols and whenever at-sea conditions are safe for those releasing the animal(s) to do so. | | |
| 19 | All fisheries surveys | Take notification | GARFO PRD would be notified as soon as possible of all observed takes of sea turtles, and Atlantic sturgeon occurring as a result of any fisheries survey. Specifically:<br>a. GARFO PRD would be notified within 24 hours of any interaction with a sea turtle or sturgeon (nmfs.gar.incidental-take@noaa.gov). The report would include at a minimum: (1) survey name and applicable information (e.g., vessel name, station number); (2) GPS coordinates describing the location of the interaction (in decimal degrees); (3) gear type involved (e.g., bottom trawl, gillnet, longline); (4) soak time, gear configuration and any other pertinent gear information; (5) time and date of the interaction; and (6) identification of the animal to the species level. Additionally, the e-mail would transmit a copy of the NMFS Take Report Form (download at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null) and a link to or acknowledgement that a clear photograph or video of the animal was taken (multiple photographs are suggested, including at least one photograph of the head scutes). If reporting within 24 hours is not possible due to distance from shore or lack of ability to communicate via phone, fax, or email, reports would be submitted as soon as possible; late reports would be submitted with an explanation for the delay.<br>b. At the end of each survey season, a report would be sent to NMFS that compiles all information on any observations and interactions with ESA-listed species. This report would also contain information on all survey activities that took place during the season including location of gear set, duration of soak/trawl, and total effort. The report on survey activities would be comprehensive of all activities, regardless of whether ESA-listed species were observed. | Sea Turtles, ESA-listed Fish | NMFS and NJDEP |
| 20 | C, O&M | Monthly/annual reporting requirements | BOEM would ensure that the Lessee implements the following reporting requirements necessary to document the amount or extent of take that occurs during all phases of the Proposed Action:<br>a. All reports would be sent to: nmfs.gar.incidental-take@noaa.gov.<br>b. During the construction phase and for the first year of operations, the Lessee would compile and submit monthly reports that include a summary of all Project activities carried out in the previous month, including vessel transits (number, type of vessel, and route), and piles installed, and all observations of ESA-listed species. Monthly reports are due on the 15th of the month for the previous month.<br>c. Beginning in year 2 of operations, the Lessee would compile and submit annual reports that include a summary of all Project activities carried out in the previous year, including vessel transits (number, type of vessel, and route), repair and maintenance activities, survey activities, and all observations of ESA-listed species. These reports are due by April 1 of each year (i.e., the 2026 report is due by April 1, 2027). Upon mutual agreement of NMFS and BOEM, the frequency of reports can be changed. | ESA-listed Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, BSEE, NMFS, and NJDEP |
| 21 | C, O&M Year 1 | BOEM/NMFS meeting requirements for sea turtle take documentation | To facilitate monitoring of the incidental take exemption for sea turtles, through the first year of operations, BOEM and NMFS would meet twice annually to review sea turtle observation records. These meetings/conference calls would be held in September (to review observations through August of that year) and December (to review observations from September to November) and would use the best available information on sea turtle presence, distribution, and abundance; Project vessel activity; and observations to estimate the total number of sea turtle vessel strikes in the action area that are attributable to Project operations. These meetings would continue on an annual basis following year 1 of operations. Upon mutual agreement of NMFS and BOEM, the frequency of these meetings can be changed. | Sea Turtles | BOEM, BSEE, and NMFS |
| 22 | Pre-C, C, O&M, D | Data Collection BA BMPs | BOEM would ensure that all Project Design Criteria and BMPs incorporated in the Atlantic Data Collection consultation for Offshore Wind Activities (June 2021) shall be applied to activities associated with the construction and installation and O&M of the Atlantic Shores South Project, as applicable. | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM and BSEE |
| 23 | C | Alternative Monitoring Plan (AMP) for pile driving | The Lessee must not conduct pile-driving operations at any time when lighting or weather conditions (e.g., darkness, rain, fog, sea state) prevent visual monitoring of the full extent of the clearance and shutdown zones.<br>The Lessee must submit an Alternative Monitoring Plan (AMP) to BOEM and NMFS for review and approval at least 6 months prior to the planned start of pile driving. This plan may include deploying additional observers; alternative monitoring technologies such as night vision, thermal, and infrared technologies; and use of PAM and must demonstrate the ability and | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |

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| | | | effectiveness to maintain all clearance and shutdown zones during daytime as outlined below in Part 1 and nighttime as outlined below in Part 2 to BOEM's and NMFS' satisfaction.<br>The AMP include two stand-alone components as described below:<br>• Part 1 – Daytime when lighting or weather (e.g., fog, rain, sea state) conditions prevent visual monitoring of the full extent of the clearance and shutdown zones. Daytime being defined as 1 hour after civil sunrise to 1.5 hours before civil sunset.<br>• Part 2 – Nighttime inclusive of weather conditions (e.g., fog, rain, sea state). Nighttime being defined as 1.5 hours before civil sunset to one hour after civil sunrise.<br>If a protected marine mammal or sea turtle is observed entering or found within the SZs after impact pile driving has commenced, the Lessee would follow the shutdown procedures outlined in Section 1.4.4 of the Protected Species Management and Equipment Specifications Plan. The Lessee would notify BOEM and NMFS of any shutdown occurrence during pile-driving operations within 24 hours of the occurrence unless otherwise authorized by BOEM and NMFS.<br>The AMP should include, but is not limited to, the following information:<br>• Identification of night vision devices (e.g., mounted thermal/IR camera systems, hand-held or wearable NVDs, IR spotlights), if proposed for use to detect protected marine mammal and sea turtle species.<br>• The AMP must demonstrate (through empirical evidence) the capability of the proposed monitoring methodology to detect marine mammals and sea turtles within the full extent of the established clearance and SZs (i.e., species can be detected at the same distances and with similar confidence) with the same effectiveness as daytime visual monitoring (i.e., same detection probability). Only devices and methods demonstrated as being capable of detecting marine mammals and sea turtles to the maximum extent of the clearance and SZs will be acceptable.<br>• Evidence and discussion of the efficacy (range and accuracy) of each device proposed for low visibility monitoring, which must include an assessment of the results of field studies (e.g., Thayer Mahan demonstration), as well as supporting documentation regarding the efficacy of all proposed alternative monitoring methods (e.g., best scientific data available).<br>• Procedures and timeframes for notifying NMFS and BOEM of the Lessee's intent to pursue nighttime pile driving.<br>• Reporting procedures, contacts, and timeframes.<br>BOEM may request additional information, when appropriate, to assess the efficacy of the AMP. | | |
| 24 | O&M | Periodic underwater surveys, reporting monofilament and other fishing gear around WTG foundations | The Lessee must monitor indirect impacts associated with charter and recreational fishing gear lost from expected increases in fishing around WTG foundations by surveying at least 10 of the WTGs located closest to shore in each Project 1 and Project 2 area of the Atlantic Shores South Lease Area (OCS-A 0499) annually. If the Lessee utilizes piled jacket foundations for WTGs in Project 2, BOEM may increase the number of foundations that must be surveyed in Project 2. Survey design and effort (i.e., the number of WTGs and frequency of reporting) may be modified only upon concurrence by BOEM and BSEE. The Lessee must conduct surveys by remotely operated vehicles, divers, or other means to determine the frequency and locations of marine debris. The Lessee must report the results of the surveys to BOEM (at renewable_reporting@boem.gov) and BSEE (at marinedebris@bsee.gov) in an annual report, submitted by April 30 for the preceding calendar year. Annual reports must be submitted in Microsoft Word format. Photographic and videographic materials must be provided on a portable drive in a lossless format such as TIFF or Motion JPEG 2000. Annual reports must include survey reports that include: the survey date, contact information of the operator, the 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, Sea Turtles, ESA-listed Fish | BOEM, BSEE, and NMFS |
| 25 | Pre-C, C, O&M, D | PDC minimize vessel interactions with protected species (from HRG Programmatic) | All vessels associated with survey activities (transiting [i.e., travelling between a port and the survey site] or actively surveying) must comply with the vessel strike avoidance measures (PDC-5) in the Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection, last revised in November 2021, including the measures below. The only exception is when the safety of the vessel or crew necessitates deviation from these requirements.<br>• If any ESA-listed marine mammal is sighted within 1,640 feet (500 meters) of the forward path of a vessel, the vessel operator must steer a course away from the whale at <10 knots (18.5 kilometers per hour) until the minimum separation distance has been established. Vessels may also shift to idle if feasible.<br>• If any ESA-listed marine mammal is sighted within 656 feet (200 meters) of the forward path of a vessel, the vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 1,646 feet (500 meters). If stationary, the vessel must not engage engines until the large whale has moved beyond 1,646 feet (500 meters). | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, BSEE, and NMFS |

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| | | | • If a sea turtle or manta ray is sighted at any distance within the operating vessel's forward path, the vessel operator must slow down to 4 knots and steer away (unless unsafe to do so). The vessel may resume normal vessel operations once the vessel has passed the individual. | | |
| 26 | O&M | Operational Sound Field Verification Plan | BOEM would require the Lessee to develop an operational sound field verification plan to determine the operational noises emitted from the offshore wind area. The plan must include measurement procedures and results reporting that meet ISO standard 18406:2017 (Underwater acoustics – Measurement of radiated underwater sound from percussive pile driving). The plan would be reviewed and approved by BOEM and NMFS. | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, BSEE, and NMFS |
| 27 | C | Sound field verification of foundation installation | The Lessee must submit a Sound Field Verification Plan consistent with requirements of the NMFS Biological Opinion. The results of sound field verification must be compared to modeled injury and disturbance isopleths for marine mammals, sea turtles, and Atlantic sturgeon. | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, NMFS, and BSEE |
| 28 | C | Minimum visibility requirement | In order to commence pile driving at foundations, PSOs must be able to visually monitor a 6,244-foot (1,900-meter) radius from their observation points for at least 60 minutes immediately prior to piling commencement.<br>In order to commence pile driving at trenchless installation sites, PSOs must be able to visually monitor a 3,280-foot (1,000-meter) radius from their observation points for at least 30 minutes immediately prior to piling commencement.<br>Acceptable visibility will be determined by the Lead PSO. | Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| **BOEM-Proposed Mitigation and Monitoring Measures in the USFWS BA (July 2023 and May 2024)** | | | | | |
| 1 | C, O&M, D | Monitoring and conservation | BOEM will require that the Lessee implements monitoring and/or other conservation measures to minimize disturbance of *rufa* red knots and other ESA-listed birds, in coordination with USFWS and NJDEP. | Birds | BOEM, BSEE, USFWS, and NJDEP |
| 1.a | O&M | Bird deterrent | Bird-Deterrent Devices and Plan. To minimize attracting birds to operating WTGs, the Lessee must, where safety permits, install bird perching-deterrent device(s) on each WTG and OSS. The Lessee must submit a plan to deter perching on offshore infrastructure by roseate terns and other marine birds for BOEM and BSEE approval (via renewable_reporting@boem.gov and TIMSWeb). The Lessee must resolve all comments on the Bird Perching Deterrent Plan to BOEM's and BSEE's satisfaction before the Lessee may begin installation of WTGs or OSSs. The Bird Perching Deterrent Plan must include the type(s) and locations of bird perching-deterrent devices, include a maintenance plan for the life of the Project, allow for modifications and updates as new information and technology become available, track the efficacy of the deterrents, and include a timeline for installation. The plan will be based on best available science regarding the efficacy of perching deterrent devices on avoiding and minimizing collision risk. The location of bird-deterrent devices must be proposed by the Lessee based on BMPs applicable to the appropriate operation and safe installation of the devices. The Lessee must submit the Bird Perching Deterrent Plan with the FIR. The Bird Perching Deterrent Plan must be approved before the Lessee may commence installation of any WTGs or OSSs. The Lessee must also provide the location and type of bird-deterrent devices as part of the as-built submittals to BSEE. | Birds | BSEE and USFWS |
| 1.b | O&M | Light impact reduction | The Lessee must use an FAA-approved vendor for the ADLS, which will activate the FAA hazard lighting only when an aircraft is in the vicinity of the wind facility to reduce visual impacts at night. The Lessee must confirm the use of an FAA-approved vendor for ADLS on WTGs and OSSs in the FDR. | Bats, Birds | BSEE and USFWS |
| 1.c | O&M | Light impact reduction | Navigation Lighting Upward Illumination Minimization (Planning) (Construction) (Operations). Nothing in this condition supersedes or is intended to conflict with lighting, marking, and signaling requirements of FAA, USCG, or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable including lighting designed to minimize upward illumination. The Lessee must provide USFWS with a courtesy copy of the final Lighting, Marking, and Signaling plan, and the Lessee's approved application to USCG to establish Private Aids to Navigation. | Bats, Birds, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and USCG |
| 1.d | C, O&M, D | Minimization of beach impacts | Both during and after construction, the Lessee must avoid Project-related intrusion (i.e., access through or disturbance from personnel or equipment) into any beach, dune, or tidal marsh area from March 1 to August 31. In the event that emergency access to this area is needed during the restricted season, the Lessee must coordinate with the USFWS and the NJFW's Endangered and Nongame Species Program to seek approval. | Birds | USFWS and NJDEP |
| 1.e | C | Minimization of beach impacts | The Lessee must avoid the use of HDD at the Monmouth Landfall location during the piping plover nesting season (March 15 to the fledging of the last chick), unless coordination with USFWS deems not necessary due to a review of noise impacts. | Birds | USFWS and NJDEP |
| 1.f | C, O&M, D | Minimization of beach impacts | Both during and after construction, the Lessee must avoid Project activities within 500 feet of any beach or dune from March 15 to August 31. In the event that essential access to this area is needed during the restricted season, the Lessee must coordinate with the USFWS and the NJFW's Endangered and Nongame Species Program to seek approval. | Birds | USFWS and NJDEP |

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| 1.g | C, O&M, D | Minimization of impacts on ESA-listed species | *Rufa* red knot: Along onshore export cable routes, the Lessee must avoid permanent modification of suitable red knot habitats. Where temporary habitat disturbance is unavoidable, the Lessee must develop a restoration plan in coordination with USFWS for USFWS approval. | Birds | USFWS and NJDEP |
| 1.h | C, O&M, | Minimization of impacts on ESA-listed species | Roseate tern: The Lessee must avoid disturbing roosting terns to the extent practicable during construction and operations and maintenance, affording at least a 300-foot buffer for people on foot and for vehicles to avoid flushing the birds. USFWS anticipates most staging flocks of terns will occur from July through September. | Birds | USFWS and NJDEP |
| 1.i | C, O&M, D | Minimization of impacts on ESA-listed species | Eastern black rail and saltmarsh sparrow: No planned or routine Project entry or intrusion into wetlands either during or after construction will occur. Emergency access must be coordinated with USFWS and NJFW. If areas of suitable eastern black rail and/or saltmarsh sparrow habitat will be affected by Project activities, the Lessee must coordinate with USFWS to develop appropriate conservation measures that the Lessee is required to implement to avoid adverse effects on these species. Conservation measures will include that construction activities and other Project-related intrusions into areas of suitable habitat will be seasonally restricted from April 1 through September 30 (April 1 through September 30 for eastern black rail and May 1 to September 30 for saltmarsh sparrow) in order to minimize the risk of directly disturbing or injuring adults, eggs, or chicks during sensitive periods of the breeding season. | Birds | USFWS and NJDEP |
| 2 | C | Pre-construction surveys | BOEM will require that the Lessee conducts pre-construction surveys for ESA-listed bats and implements avoidance and minimization measures in coordination with USFWS and NJDEP. | Bats | USFWS and NJDEP |
| 2.a | C | Replanting Plan | The Lessee must develop and implement a replanting plan in areas of temporary deforestation. The replanting plan must include the identification of specific tree species and densities, timing of planting, protection of saplings from herbivory, monitoring, and invasive species control in order to provide high-quality bat habitat and must be provided to USFWS for approval prior to commencing onshore construction activities. | Bats | USFWS and NJDEP |
| 2.b | O&M | Tree clearing restrictions | The Lessee will coordinate with the USFWS prior to any clearing of trees (> 3 inches dbh) required during operation and maintenance. | Bats | USFWS and NJDEP |
| 2.c | O&M, D | Structure demolition | The Lessee must contact USFWS to assess the potential risk to ESA-listed bat species should any onshore structures require demolition during the O&M or decommissioning phase. If USFWS determines that adverse effects exist, the Lessee must coordinate with USFWS to develop appropriate mitigation measures that the Lessee is required to implement to avoid adverse effects on listed bat species. | Bats | USFWS and NJDEP |
| 3 | C, O&M, D | Bird and Bat Monitoring Plan | The Lessee must develop and implement a BBMP in coordination with USFWS and other relevant regulatory agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring.<br>Prior to commencing offshore construction activities, the Lessee must submit the BBMP for BOEM (via renewable_reporting@boem.gov) and USFWS review. BOEM and USFWS will review the BBMP and provide any comments on the plan within 30 calendar days of its submittal. The Lessee must resolve all comments on the BBMP to BOEM and USFWS's satisfaction before implementing the plan.<br>a. **Monitoring**. The Lessee must conduct monitoring as outlined in the Bird and Bat Monitoring Plan.<br>b. **Annual Monitoring Reports**. The Lessee must submit to BOEM (via renewable_reporting@boem.gov), USFWS, and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within 12 months of completion of the survey season. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. The 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 BBMP. The BOEM, BSEE, and USFWS reserve the right to require reasonable revisions to the BBMP and may require new technologies as deemed demonstrated, reasonable and prudent.<br>c. **Post-Construction Quarterly Progress Reports**. The Lessee must submit quarterly progress reports during the implementation of the BBMP to BOEM (at renewable_reporting@boem.gov) and the USFWS by the 15th day of the month following the end of each quarter during the first full year that the Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered.<br>d. **Monitoring Plan Revisions.** Within 30 calendar days of submitting the annual monitoring report, the Lessee must meet with BOEM and USFWS to discuss the following: the monitoring results; the potential need for revisions to the BBMP, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If BOEM or USFWS determines after this discussion that revisions to the BBMP are necessary, BOEM may require the Lessee | Bats, Birds | BOEM, BSEE and USFWS |

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| | | | to modify the BBMP. If the reported monitoring results deviate substantially from the impact analysis included in the Final BA, the Lessee must transmit to BOEM recommendations for new mitigation measures and/or monitoring methods.<br>e. **Operational Reporting (Operations).** The Lessee must submit to the BOEM (via renewable_reporting@boem.gov) and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition data for all WTGs together in tabular format: the proportion of time the WTGs were operational (spinning) each month, the average rotor speed (rpm) of spinning WTGs plus 1 standard deviation, and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. Any operational data considered by the Lessee to be privileged or confidential must be clearly marked as confidential business information and will be handled by BOEM and BSEE in a manner consistent with 30 C.F.R. § 585.114.<br>f. **Raw Data.** The Lessee must store the raw data from all avian and bat surveys and monitoring activities using accepted archiving practices. Such data must remain accessible to the BOEM, BSEE, and USFWS, upon request for the duration of the lease. The Lessee must work with the BOEM to ensure the data are publicly available. All avian tracking data (i.e., from radio and satellite transmitters) must be stored, managed, and made available to the BOEM, BSEE, and USFWS following the protocols and procedures outlined in the agency document entitled Guidance for Coordination of Data from Avian Tracking Studies, NABat, Northwest Atlantic Seabird Catalog, and IMR. | | |
| 4 | C, O&M, D | Bird and bat mortality reporting | Incidental Mortality Reporting. The Lessee must provide an annual report to BOEM, BSEE, and USFWS documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. 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 USGS Bird Band Laboratory, available at https://www.pwrc.usgs.gov/BBL/bblretrv/. Incidental observations are extremely unlikely to document any fatalities of listed birds that may occur due to WTG collision. While this conservation measure appropriately requires documentation and reporting of any fatalities observed incidental to O&M activities, the BBMP will make clear that lack of documented fatalities in no way suggests that fatalities are not occurring. Likewise, the agencies will not presume that any documented fatalities were caused by colliding with a WTG unless there is evidence to support this conclusion. The Lessee must also submit to BOEM, BSEE, and USFWS an annual report covering each calendar year, due by January 31, documenting the implementation of any collision measures during the preceding year. | Bats, Birds | BOEM, BSEE, and USFWS |
| 5 | C, O&M, D | Bird and bat mortality reporting | Immediate Reporting. Any occurrence of a dead or injured ESA-listed bird or bat must be reported to the BOEM, BSEE, and USFWS as soon as practicable (taking into account crew and vessel safety), but no later than 72 hours after the sighting, and, if practicable, the dead specimen will be carefully collected and preserved in the best possible state. The BOEM will coordinate with USFWS on procedures and required permits for processing and handling specimens. | Bats, Birds | BOEM, BSEE, and USFWS |
| 6 | C, O&M, D | Tree clearing restrictions | Because many wildlife species overwinter in cavities and nests, any mature trees slated for removal should be checked (including for vacant raptor nests) and avoided if possible. If the tree must be taken down, this should occur between October 1 and March 31. | Bats, Birds | BOEM, BSEE, and USFWS |
| 7 | C, O&M, D | Revegetation Plan | The Lessee must develop a Revegetation Plan for areas of temporary disturbance that includes replanting with native vegetation and monitoring and corrective action for invasive plant species. | Coastal Habitat and Fauna | USFWS and NJDEP |
| 8 | C | Pre-construction surveys and monarch butterfly avoidance | The Lessee must conduct pre-construction surveys for milkweed (*Asclepias* spp.) and implement monarch butterfly avoidance and minimization measures in coordination with USFWS and NJDEP. | Coastal Habitat and Fauna | USFWS and NJDEP |
| 8.a | C, O&M, | Seasonal restriction for milkweed habitat | For areas where vegetation disturbance will occur during Project construction or post-construction operations and maintenance activities, the Lessee must survey the affected area for milkweed (*Asclepias* spp.) before the start of work. The Lessee must avoid clearing milkweed to the extent practicable from May 15 through September 30 when monarch caterpillars may be present. If/when the monarch is proposed for federal listing, The Lessee will coordinate with USFWS prior to initiating any in-season vegetation disturbance that may involve milkweed. | Coastal Habitat and Fauna | USFWS and NJDEP |
| 8.b | C, O&M | Monarch butterfly habitat enhancement | COA-08 was modified to enhance monarch butterfly habitat in coordination with USFWS and NJDEP. The Lessee must develop a Revegetation Plan to enhance monarch butterfly habitat for areas of temporary disturbance and incidental to other Project activities. The Lessee must consult the New Jersey Monarch Butterfly Conservation Guide in developing the plan and submit the plan for USFWS review. | Coastal Habitat and Fauna | USFWS and NJDEP |
| 8.c | O&M | Limited use of herbicides | The Lessee will not use herbicide for right-of way maintenance and in other portions of the Project where milkweed is likely to occur. | Coastal Habitat and Fauna | USFWS and NJDEP |

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| 9 | C | Pre-construction surveys | BOEM will require the Lessee to conduct pre-construction habitat surveys for ESA-listed plants and implement avoidance and mitigation measures in coordination with USFWS and NJDEP. | Coastal Habitat and Fauna | USFWS and NJDEP |
| **Conservation Recommendations and Terms and Conditions from the USFWS Biological Opinion Issued December 1, 2023** | | | | | |
| USFWS CR 4 | O&M | Compensatory mitigation for ESA-listed species | Compensatory Mitigation for Piping Plover, Red Knot, and Roseate Tern (Planning) (Construction) (Operations). At least 180 days prior to the commissioning of the first WTG, the Lessee must distribute a Compensatory Mitigation Plan to BOEM, BSEE, and USFWS for review and comment. BOEM, BSEE, and USFWS will review the Compensatory Mitigation Plan and provide any comments on the plan to the Lessee within 60 days of its submittal. The Lessee must resolve all comments on the Compensatory Mitigation Plan to BOEM's and BSEE's satisfaction before implementing the plan and before commissioning of the first WTG. The Compensatory Mitigation Plan must provide compensatory mitigation actions to offset take of piping plover, red knot, and roseate tern by the fifth year of WTG operation. The Compensatory Mitigation Plan must include a) detailed description of the mitigation actions; b) the specific location for each mitigation action; c) a timeline for completion of the mitigation actions; d) itemized costs for implementing the mitigation actions; e) details of the mitigation mechanisms (e.g., mitigation agreement, applicant-proposed mitigation); and f) monitoring to ensure the effectiveness of the mitigation actions in offsetting take. | Birds | USFWS and NJDEP |
| **EFH Conservation Recommendations[2] BOEM Intends to Adopt or Partially Adopt** | | | | | |
| EFH CR 4 | Pre-C, C, O&M, D | Micrositing Plan/Anchoring Plan | Avoid all bottom-disturbing activities (e.g., anchoring, jack-up barge footing, jetting, site-preparation activities) in or through the western portion of Lobster Hole and the stable, spatially complex, high-relief sand ridge/trough habitats in the southern tip of the lease to avoid and minimize impacts to those important habitats. Plans (see CR 7 below) should be developed to facilitate avoidance of bottom disturbing activities in these areas. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 5 | C | Micrositing WTG | Remove or relocate the WTG (#116 according to the VirGeo online mapper) from the northeast edge of the Atlantic City Reef site to avoid and minimize impacts to this important prime fishing area and the established artificial reefs within the site. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 6 | C | Reef avoidance | Avoid any activities (i.e., site preparation) or placement of permanent structures (i.e., WTGs, OSSs, cables) within the boundaries of any designated artificial reef site (managed/maintained by NJDEP) such as the Atlantic City Reef, Manasquan Inlet Reef, and Axel Carson Reef. Placing infrastructure within artificial reef boundaries would preclude future placements by the NJDEP Artificial Reef Program and interfere with the extensive recreational fishing activities in those areas. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing | BOEM, BSEE, and NMFS |
| EFH CR 7 | Pre-C, C | Infrastructure Micrositing Plan | Avoid and minimize impacts on sensitive benthic habitats through micrositing of Project infrastructure (WTGs, OSSs, cables). Develop and implement an infrastructure micrositing plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. NMFS recommends the plan use Seabed Interpretation/Sediment maps combined with multibeam backscatter data and boulder layers (data) to inform 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 micrositing plan should avoid and minimize areas in the following order of preference: (i) complex habitats (ii) heterogeneous complex habitats; (iii) biogenic habitat (i.e., clam beds); and (iv) areas with benthic features (e.g., sand waves) or bathymetric features (e.g., ridge crest, ridge flank, swale/trough/depression). A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. Following the completion of construction, NMFS HESD should also be provided with information on how the plan was implemented. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 8 | C | Cross-map cables | To the extent practicable, cables unable to avoid complex habitats and benthic features should cross mapped complex habitat areas (including complex and heterogeneous complex habitats) perpendicularly at the narrowest points and be sited along natural benthic contours within troughs/lows, to maximize cable burial while minimizing disturbance to local submarine topography. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 9 | C | Seabed preparation avoidance measures | To avoid and minimize impacts on benthic and fish habitats, sand bedform removal should be avoided entirely and control flow excavation or dredging (hydraulic/suction hopper, mechanical/excavator) with open water/unconfined disposal should not be used during any seabed preparation activities. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |

[2] NMFS EFH Consultation letter dated October 16, 2023 provided EFH Conservation Recommendations for activities under BOEM's jurisdiction and activities under USACE's jurisdiction.

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| EFH CR 10 | C | Sand bedform removal and relocation – reinitiation of consultation | Because BOEM/USACE or the Lessee have yet to provide adequate, Project-specific information on sand bedform removal and relocation (seabed preparation)—including the specific locations, extents/areas, time/durations and frequency for activities and information such as which methods would be used for how long at which locations—EFH consultation should be reinitiated if sand bedform removal, dredging or control flow excavation is undertaken. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 11 | C | Sand Bedform Removal Plan | Should BOEM/USACE move forward with sand bedform removal activities without reinitiating EFH consultation, a sand bedform removal plan (draft) should be developed at least 180 days in advance of work and shared with NMFS for review and comment. This lead-time will allow the Lessee to make substantive changes to the plan based on NMFS' comments and provide an updated plan at least 90 days in advance of work for red flag review and comment. This plan should, in conjunction with the WTG, OSS, and cable micrositing plans, facilitate the minimization of sand bedform removal, along with employing technology that will result in the least amount of seabed disturbance and suspension of sediment. The plan should include detailed maps/figures identifying the sites/locations/acreages for all bedform removal and dredge material disposal; dredge disposal should not occur in/on sensitive benthic habitats. The plan should also include coordination with USACE and NJDOT for beneficial reuse in beach nourishment projects or supplementing sand resources in nearby approved sand borrow areas. A copy of the draft and final plans should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov at least 180 (draft) and 90 (final) days prior to construction. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 12 | C | Cable installation | Cables (interarray, interconnection, interlink, and export) should be installed into the existing seafloor via jetting (i.e., jet trenching) or mechanical trenching with simultaneous lay and burial and laid in ways that maintain submarine topography and contours on medium (meter) to large (kilometer) scales; benthic features including megaripples and sand waves (inclusive of sand ridge and troughs and sand banks) should be maintained. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 13 | C | Cable installation via trenching | Surficial sediment "mobility" should be taken into account when installing cables via trenching in order to achieve and maintain target burial depths. "Over trenching" (i.e., trenching deeper than target to account for surficial sediment mobility) should be used to achieve proper burial depths in areas with mobile surficial sediments. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 14 | C | Cable depth | HVDC cables should be buried the maximum depth (6.5 ft.) below the stable seabed to minimize impacts to habitats and species from exposure to anthropogenically elevated electromagnetic fields (EMFs) and heat. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 15 | C | Boulder/cobble relocation | To minimize impacts on sensitive benthic habitats from boulder/cobble removal or relocation activities, boulders and cobbles should be moved using boulder "pick" methods as close to the impact area as practicable, in areas immediately adjacent to existing similar complex bottom, placed in a manner that does not hinder navigation or impede commercial fishing and avoids impacts to existing complex habitats. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 16 | Pre-C, C | Boulder Relocation Plan | Develop and implement a boulder relocation plan to facilitate the avoidance and minimization of impacts to sensitive benthic habitats. We recommend the plan use Seabed Interpretation/Sediment maps combined with multibeam backscatter data and boulder layers (data) to inform micrositing. The plan should demonstrate/describe how impacts to sensitive benthic habitats and other elements (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 can be taken in real time. A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. Following the completion of construction, NMFS HESD should also be provided with information on: (1) how the plan was implemented; and (2) locations of relocated boulders (as-built maps/figures). | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 17 | C | Marine debris removal | Any debris encountered during a site preparation grapnel run should be retained and discarded at an appropriate upland facility. Debris should not be returned overboard. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 18 | Pre-C, C, O&M, D | Seafloor surveying and monitoring | To minimize impacts of benthic habitat modification, in all 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, side scan sonar) capable of detecting bathymetry changes of 0.5 meter 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 NMFS HESD in a viewable format at NMFS.GAR.HESDoffshorewind@noaa.gov. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |

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| EFH CR 19 | C | Anchoring | Avoid anchoring or placing jack-up barge spud cans or footings on/in sensitive benthic habitats or where medium to high multibeam backscatter returns occur. 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. If vessels must remain stationary, dynamic positioning systems (DPS) or mid-line buoys on anchor chains should be required to minimize impacts on those habitats. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 20 | Pre-C, C | Spud can location | If placement of jack-up barge spud cans is necessary in sensitive benthic habitats, NMFS recommends proposed locations for the spud cans be selected to avoid areas in the following order of preference: (i) complex habitats (i.e., areas of medium to high backscatter); (ii) heterogeneous complex habitats; (iii) biogenic habitat (i.e., clam beds); and (iv) areas with benthic features (e.g., sand waves) or bathymetric features (e.g., ridge crest, ridge flank, swale/trough/depression). | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 21 | Pre-C, C | Anchoring and Jack-Up Barge Plan | Develop and implement an anchoring and jack-up barge plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. NMFS recommends the plan use Seabed Interpretation/Sediment and Seabed Morphology maps combined with multibeam bathymetry and backscatter data and boulder layers (data). The plan should demonstrate/describe how impacts on sensitive benthic habitats were avoided and minimized. If avoidance and minimization was not feasible, the plan 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 NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 22 | C | Microsite cables | 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 micrositing of the cables. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 24 | C | Scour protection material | Avoid the use of plastics/recycled polyesters/net material (i.e., fronded mattresses) in all scour protection, as these materials may degrade and result in plastic pollution. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 25 | Pre-C, C | Scour Protection Plan | Develop and implement a scour protection plan to facilitate the avoidance and minimization of impacts on sensitive benthic habitats. NMFS recommends the plan use Seabed Interpretation/Sediment and Seabed Morphology maps combined with multibeam bathymetry and backscatter data and boulder layers (data). 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. NMFS HESD should be provided with post-construction information on: (1) how the plan was implemented; (2) and the locations (by type) of scour protection depicted in as-built surveys/plans, maps, and figures. NMFS HESD should also be provided with specific descriptions of how the types of scour protection were selected to mimic existing seafloor conditions. A copy of all final plans and post-construction information should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 27 | C | HVDC closed loop cooling system | Under the HVDC option, the station should use a closed loop cooling system as described in the Project documents (EFH Assessment, COP, and EIS) that does not require water withdrawals. | Finfish, Invertebrates, and Essential Fish Habitat | BSEE |
| EFH CR 28 | C | Noise mitigation system | Additional noise dampening/mitigation measures should be used during all impact pile driving within 5.9 nautical miles (11 kilometers) of any artificial reef sites/shipwrecks/fish havens (such as the Atlantic City Reef, the Great Egg Reef, and the Little Egg Reef), where fish are known to aggregate. Should sound field verification indicate impacts beyond 11.94 kilometers, noise dampening/mitigation measures should be used within the entire zone of elevated underwater noise. Additional noise mitigation measures include, but are not limited to, isolation casings, isolation casings with bubble curtains inside, and double-walled isolation casings. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 29 | C | Limits to pile driving | Continuous pile driving for 24 hours/day should not be permitted; minimum mandatory quiet periods of at least 4 hours should be required per 24 hours. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 31 | Pre-C | Noise Mitigation Plan | A plan outlining the noise mitigation procedures should be filed with BOEM and USACE for approval before construction commences. BOEM should provide NMFS HESD with a copy of the final plan at NMFS.GAR.HESDoffshorewind@noaa.gov before in-water work begins. The noise mitigation plan should include (i) passive acoustic sound verification monitoring during pile-driving activities; additional noise dampening technology should be applied should real-time monitoring indicate noise levels | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |

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| | | | exceed the modeled 10 decibel attenuation levels; (ii) a process for notifying NMFS HESD within 24 hours if any evidence of a fish kill during construction activity is observed, and contingency plans to resolve issues; and (iii) acoustic monitoring reports that include any/all noise-related monitoring should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov. | | |
| EFH CR 42 | Pre-C | Benthic Habitat Monitoring Plan | Revise the Benthic Habitat Monitoring Plan (dated December 15, 2021) to address agency concerns with the currently proposed plan's ability to monitor benthic habitat change across the Lease Area and ECC resulting from Project-related impacts. Specifically, the plan should incorporate sufficient temporal surveying, both pre- and post-construction; and include a minimum of 3 years of annual baseline data collection prior to construction and a minimum of 5 years of annual data collection post-construction. To address concerns related to the ability to detect benthic habitat change across the lease and ECC, the monitoring plan should incorporate a habitat stratification component and update the power analyses accordingly. Specifically, monitoring sites should be randomly stratified across impact monitoring sites in complex, heterogeneous complex, and soft habitat classifications. Further, update 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. Finally, the high-resolution multibeam echosounding component of the Benthic Monitoring Plan should be expanded for leasewide collection of acoustic data. Leasewide collection of acoustic data should be able to quantify the extent of habitat conversion and distribution across the WTA and ECC. The Lessee should consult with the resource agencies while editing this plan and give the resource agencies a minimum of 90 days to review and comment on the plan. The applicant should submit a final plan to BOEM that addresses, and includes, all resource agency comments, as well as the applicant's response to those comments. A copy of the final monitoring plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to commencement of any in-water work. All data and metadata should be made available to NMFS HESD. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 43 | Pre-C, C, O&M, D | *In-situ* Monitoring Program | Develop an *in-situ* Project-specific monitoring program to address uncertainties related to impacts of the operation of the 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 would facilitate more effective or efficient mitigation recommendations. Incorporation of this monitoring recommendation would further align the monitoring efforts at the Project with the NMFS and BOEM Federal Survey Mitigation Strategy, which has evaluation and integration of wind energy monitoring studies with NMFS surveys as a primary goal. The Project-specific monitoring program should measure *in situ* the stressors created by Project operation on the ecosystem from the presence of turbines, operational noise, heat and EMF exposure, and oceanic-wind wake effects. Studies should evaluate the biological effects of those stressors on commercially important species in the Project area, in particular ocean quahog and Atlantic surf clam. Monitoring plans should include the collection of baseline data and be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov and NEFSC for review and comment within 90 days of ROD issuance. A response to NMFS comments should be provided. These monitoring studies should be developed in partnership with NMFS and other scientific institutions to aid in addressing these and other questions:<br>a. If any infrastructure is installed on/in Lobster Hole or the stable, spatially complex, high-relief sand ridge/trough habitats in the southern tip of the Lease Area, how does construction and permanent placement of WTGs, OSSs, and cables impact Lobster Hole and sand ridge and trough habitat?<br>i. What are the effects of construction and operation (presence) on physical characteristics of Lobster Hole and sand ridge and troughs over time, including sediment properties and shape/geometry, depth, and rugosity?<br>ii. To what extent do fish assemblages and food web dynamics change in/on Lobster Hole as a result of construction and operation of the wind farm?<br>iii. What is the distribution, abundance, survival, growth rate, and recruitment rate of shellfish (Atlantic surfclam, sea scallop, and ocean quahog) along a distance gradient from disturbed habitats pre- and post-construction?<br>b. How does the placement of WTGs, OSS, and the farm as a whole affect oceanographic and atmospheric processes within and adjacent to the Lease Area?<br>i. How far do atmospheric wind wake impacts extend from the Project during operation and what is the magnitude of impact?<br>ii. What are the effects of wind farm/turbine presence on physical water column properties, primary and secondary production, and larval dispersal for species with designated EFH in the Project area?<br>c. What is the spatial distribution and intensity of the EMF and heat emissions around interarray and export cables? | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | i. What is the behavioral response to the altered EMF of fisheries resources and/or predator and prey species with life stages that have a known EMF sensitivity?<br>ii. Is there a difference in the exposure to EMF and heat and/or behavioral response to the HVAC cables compared to the HVDC cables if multiple cable types are used?<br>d. How far do effects on sound pressure, particle motion, and substrate vibration extend from the individual WTGs and ASOWS collectively?<br>i. What effect do these operational noise effects have on the respiration rates of species with designated EFH in the Project area such as ocean quahog and Atlantic surfclam? | | |
| EFH CR 44 | C, O&M, D | Spill preventative measures | Require the implementation of preventive measures 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. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| EFH CR 45 | C, O&M | Anti-corrosion protection measures | 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 BMPs for reducing spills should be implemented if reapplied offshore. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | BOEM, BSEE, and NMFS |
| **EFH Conservation Recommendations[3] USACE May Adopt or Partially Adopt** | | | | | |
| EFH CR 32 | C | In-water work time restrictions: estuarine/ inshore (back bay waters) | Avoid in-water work including cable installation, seabed preparation, pile installation (i.e., for bulkheads/cofferdams, wharfs), HDD pit excavation, or other extractive or turbidity/sediment-generating activities from: January 1 to May 31 of any given year in estuarine/inshore (back bay) waters of 6 meters in depth or less to avoid impacts on winter flounder early life stages (spawning adults, eggs, larvae). | Finfish, Invertebrates, and Essential Fish Habitat | USACE and NMFS |
| EFH CR 33 | C | In-water work time restrictions: designated sandbar shark EFH-HAPC | Avoid in-water work including cable installation, seabed preparation, pile installation (i.e., for bulkheads/cofferdams, wharfs), HDD pit excavation, or other extractive or turbidity/sediment-generating activities from June 1 through September 15 of any given year in designated sandbar shark EFH-HAPC where depths exceed 2.6 feet at MLW. | Finfish, Invertebrates, and Essential Fish Habitat | USACE and NMFS |
| EFH CR 34 | Pre-C, C | Minimization to impacts on benthic habitats | In all inshore/estuarine areas 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 re-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 NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | USACE and NMFS |
| EFH CR 35 | C | Trench avoidance in open nearshore/ estuarine waters | Avoid trenching (without immediate backfill/infill), sidecasting, and other open-water disposal in open nearshore/estuarine waters. If open trenching is used, excavated materials should not be sidecast or placed in the aquatic environment. In areas with elevated levels of contaminants, a closed clamshell/environmental bucket dredge should be used. All materials should be stored on uplands or barges and placed back into the trench to restore the excavated areas, or removed to a suitable upland disposal site if the material contains elevated levels of contaminants. Trenched areas should be restored to pre-construction conditions with native and/or clean, compatible material. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat | USACE and NMFS |
| FWCA CR 1 | C, O&M, D | Fish and Wildlife Coordination Act (FWCA): Scientific Surveys | The Project should be required to mitigate the major impacts on NMFS scientific surveys consistent with NMFS-BOEM Federal Survey Mitigation Strategy, Northeast U.S. Region. Atlantic Shores' plans to mitigate these impacts at the Project and regional levels should be provided to NMFS for review and approval prior to BOEM's decision on its acceptance. Mitigation is necessary to ensure that NMFS can continue to accurately, precisely, and timely execute our responsibilities to monitor the status and health of trust resources. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing | USACE and NMFS |
| FWCA CR 2 | C, O&M, D | FWCA: artificial reef avoidance | Impacts on the Atlantic City Reef, Great Egg Reef, and the Little Egg Reef (NJDEP artificial reefs) should be avoided due to their importance as habitat for a variety of managed species in addition to the strong recreational fisheries they support.<br>a. Additional noise attenuating devices such as isolation casings should be used during pile driving of WTGs and OSSs that may impact these artificial reef areas through elevated underwater noise (any pile driving within 5.9 nautical miles [11 kilometers] of these sites).<br>b. The developer should conduct in-situ monitoring of artificial reefs pre-, during, and post-construction to evaluate temporary, short-term and permanent impacts on these habitats and the species (e.g., black sea bass, tautog, weakfish, scup) that use them: | Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing | USACE and NMFS |

[3] NMFS EFH Consultation letter dated October 16, 2023 provided EFH Conservation Recommendations for activities under BOEM's jurisdiction and activities under USACE's jurisdiction.

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| | | | i. Hydrophones should be used to monitor/directly measure noise at various reefs throughout the reef sites. This monitoring will provide insights (validations) on the expected noise levels and distances described in the EFH assessment and other documents and will enable comparisons of "observed" (real world) versus "expected" (modeled/predicted). Monitoring should establish ambient noise levels (pre-construction) and determine noise levels from pile installation activities (during) and operation (post-construction) of the WTGs and farm;<br>ii. Camera systems (e.g., GoPros) and other relevant methods (e.g., direct observation via divers) should be used to monitor fish behavior;<br>iii. Traps and camera systems should be used to monitor fish species occurrence, community composition, and density/abundance.<br>iv. Monitoring data should be analyzed using statistically rigorous methods to evaluate the potential impacts of elevated underwater noise from pile installation and WTG and wind farm operation on artificial reefs. | | |
| FWCA CR 3 | C | FWCA: Notification of location of relocated boulders, created berms, and scour protection | Locations of relocated boulders, created berms, and scour protection, including cable protection measures (i.e., concrete mattresses) should be provided to all relevant marine users (including commercial and recreational fishing community) as soon as possible to help inform all interested parties of potential gear obstructions. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing | USACE and NMFS |
| FWCA CR 4 | C | FWCA: Notification of location of cables requiring wet storage | Locations of cables requiring wet storage (with or without cable protection such as concrete mattresses) should be provided to all relevant marine users (including commercial and recreational fishing community) as soon as possible to help inform all interested parties of potential gear obstructions to ensure that fishing vessels and other mariners are aware of the obstruction and the approximate length of time the obstruction will be present. | Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing | USACE and NMFS |
| **Reasonable and Prudent Measures and Terms and Conditions from the NMFS Biological Opinion Issued December 18, 2023** | | | | | |
| RPM 1 | C | Pile driving | Effects on ESA-listed species must be minimized and monitored during pile driving. | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| RPM 2 | C, O&M, D | Vessel operations | Effects on ESA-listed sturgeon resulting from Project vessel operations in the Delaware Bay and Delaware River must be monitored and reported. | ESA-listed Fish | BOEM, BSEE, and NMFS |
| RPM 3 | C, O&M, D | Reporting requirements | Effects on, or interactions with, ESA-listed Atlantic sturgeon, marine mammals, and sea turtles must be properly documented during all phases of the proposed action, and all incidental take must be reported to NMFS GARFO. | ESA-listed fish, Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| RPM 4 | C | Review of Plans | Plans must be prepared that describe 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 concurrence. | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| RPM 5 | C, O&M, D | Onsite observation and inspection | 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 Biological Opinion. Onsite 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 Biological Opinion, including its Incidental Take Statement. | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, and NMFS |
| T&C 1 | C | Pile driving | To implement the requirements of RPM 1 for ESA-listed whales, the Lessee must comply with the measures specified in the proposed ITA (which are incorporated into the proposed action) as modified or supplemented in the final MMPA ITA, to minimize effects of pile driving and other activities on ESA-listed whales. To facilitate implementation of this requirement:<br>a. BOEM must require, through an enforceable condition of their approval of the Lessee's Construction and Operations Plan, the Lessee to comply with any measures included in the proposed ITA, which already have been incorporated into the proposed action, as modified or supplemented by the final MMPA ITA.<br>b. NMFS OPR must ensure compliance with all mitigation measures as prescribed in the final ITA. We expect this will be carried out through NMFS OPR's review of plans and monitoring reports, including interim and final SFV reports, submitted by Atlantic Shores 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. | ESA-listed Marine Mammals | BOEM, BSEE, NMFS, and USACE |

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| | | | c. The 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 Atlantic Shores 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. | | |
| T&C 2 | C | Pile driving | To implement the requirements of RPM 1, the following measures related to sound field verification (SFV) for impact pile driving carried out for WTG, OSS, and Met Tower foundation installation must be implemented by BOEM, BSEE, USACE, and/or the Lessee. The purpose of SFV and the steps outlined here are to ensure that Atlantic Shores 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. These thresholds, identified and described in this Biological 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 Atlantic Shore's initial pile-driving methodology and sound attenuation measures will result in noise levels that do not exceed the identified distances (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 those thresholds prior to the next pile being driven.<br>a. BOEM, BSEE, and USACE must require, and Atlantic Shores must implement, thorough SFV on at least the first three monopiles installed each calendar year (see also T&C 10.d. below) in accordance with the additional requirements specified here. Subsequent thorough SFV measurements would also be required should larger piles be installed or if additional piles are driven that are anticipated to produce louder sound fields than those previously measured (e.g., higher hammer energy, greater number of strikes). If any of the 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 (see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23, 7.1.29), before the next pile is installed Atlantic Shores must implement the following measures as applicable:<br>i. Identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances (e.g., if the pile was installed with a single bubble curtain and a near field sound attenuation device, add a second bubble curtain or if the pile was installed with a double bubble curtain without a near field sound attenuation device, add a nearfield noise attenuation device; adjust hammer operations; adjust noise attenuation system to improve performance); provide a written explanation to NMFS GARFO, BOEM, BSEE, and USACE supporting that determination and requesting concurrence to proceed; and, following NMFS GARFO's concurrence, deploy those additional measures on any subsequent piles that are installed (e.g., if threshold distances are exceeded on pile 1 then additional measures must be deployed before installing pile 2). NMFS GARFO will strive to provide concurrence as quickly as possible following review of the submission and necessary coordination with the action agencies and will ensure communication with the action agencies and BOEM no later than two business days after receiving Atlantic Shores' proposal and request for concurrence.<br>ii. If any of the SFV measurements indicate that the distances to level A thresholds for ESA-listed whales (peak or cumulative) or PTS peak or cumulative thresholds for sea turtles are greater than the modeled distances (assuming 10 dB attenuation, see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23, 7.1.29), the clearance and shutdown zones (see Table 11.1) for subsequent piles must be increased so that they are at least the size of the distances to those thresholds as indicated by SFV (e.g., if threshold distances are exceeded on pile 1 then the clearance and shutdown zones for pile 2 must be expanded). 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; Atlantic Shores must submit a proposed monitoring plan for NMFS GARFO's concurrence describing the proposed deployment of additional PSOs including the number of PSOs and location of all PSOs. In the event that the clearance or shutdown zone for sea turtles needs to be expanded, the proposed monitoring plan must also include a description of how additional PSOs will be deployed to ensure effective monitoring for sea turtles in the expanded zones.<br>iii. If after implementation of 2.a.i, any subsequent SFV measurements indicate that the distances to any identified isopleth of concern are still greater than those modeled assuming 10 dB attenuation(see Tables 7.1.8, 7.1.9, 7.1.10, | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, NMFS, and USACE |

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| | | | 7.1.23, 7.1.29), Atlantic Shores must identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances; provide a written explanation to NMFS GARFO, BOEM, BSEE, and USACE supporting that determination and requesting concurrence to proceed; and, following NMFS GARFO's concurrence, deploy those additional measures or modifications on any subsequent piles that are installed (e.g., if threshold distances are exceeded on pile 2 then additional measures must be deployed before installing pile 3). NMFS GARFO will strive to provide concurrence as quickly as possible following review of the submission and necessary coordination with the action agencies and will ensure communication with the action agencies and BOEM no later than two business days after receiving Atlantic Shores' proposal and request for concurrence. Clearance and shutdown zones must be expanded consistent with the requirements of 2.b.ii.<br>iv. Following installation of the pile with additional, modified, and/or alternative noise attenuation measures or operational changes required by 2.a.iii, if SFV results indicate that any isopleths of concern are still greater than those modeled assuming 10 dB attenuation, before any additional piles can be installed, Atlantic Shores must identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances; provide a written explanation to NMFS GARFO, BOEM, BSEE, and USACE supporting that determination and requesting concurrence to proceed; and, following NMFS GARFO's concurrence, deploy those additional measures or modifications on any subsequent piles that are installed (e.g., if threshold distances are exceeded on pile 3 then additional measures must be deployed before installing pile 4). Following concurrence from NMFS GARFO, BOEM, BSEE, and USACE must require and Atlantic Shores must implement those measures and any expanded clearance and shutdown zone sizes (and any required additional PSOs) consistent with the requirements of 2.a.ii. Additionally, BOEM, BSEE, and USACE must require and Atlantic Shores must continue SFV for two additional piles with enhanced sound attenuation measures and submit the interim reports as required above (for a total of at least three piles with consistent noise attenuation measures).<br>v. If no additional measures or modifications are identified for implementation, or if the SFV required by 2.a.iv indicates that the distance to any isopleths of concerns for any ESA listed species are still greater than those modeled assuming 10 dB attenuation, 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.<br>vi. Following installation of the pile with additional, alternative, or modified noise attenuation measures/operational changes required by 2.a.iii or 2.a.iv, if SFV results indicate that all isopleths of concern are within distances to isopleths of concern modeled assuming 10 dB attenuation (see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23, 7.1.29), SFV must be conducted on two additional piles (for a total of at least three piles with consistent noise attenuation measures). If the 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 Atlantic Shores must continue to implement the approved additional, alternative, or modified sound attenuation measures/operational changes: BOEM, BSEE, USACE and/or Atlantic Shores can request concurrence from NMFS GARFO to the original clearance and shutdown zones (Table 11.1) or Atlantic Shores can continue with the expanded clearance and shutdown zones with additional PSOs.<br>b. BOEM, BSEE, and USACE must require, and Atlantic Shores must implement thorough SFV on all pin piles associated with installation of the first three pile-driven jacket foundations installed in a calendar year (see also T&C 10.d. below) in accordance with the additional requirements specified here. Subsequent thorough SFV measurements would also be required should larger piles be installed or if additional piles are driven that are anticipated to produce louder sound fields than those previously measured (e.g., higher hammer energy, greater number of strikes). If any of the SFV measurements from any pile indicate that the distance to any isopleth of concern is greater than those modeled assuming 10 dB attenuation (see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23,), before the next pile is installed Atlantic Shores must implement the following measures as applicable:<br>i. Identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances (e.g., if | | |

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| | | | the foundation was installed with a single bubble curtain and a near field sound attenuation device, add a second bubble curtain or if the pile was installed with a double bubble curtain without a near field sound attenuation device, add a nearfield noise attenuation device; adjust hammer operations; adjust noise attenuation system to improve performance); provide a written explanation to NMFS GARFO, BOEM, BSEE, and USACE supporting that determination and requesting concurrence to proceed; and, following NMFS GARFO's concurrence, deploy those additional measures on any subsequent piles that are installed (e.g., if threshold distances are exceeded on pile 1 then additional measures must be deployed before installing pile 2). NMFS GARFO will strive to provide concurrence as quickly as possible following review of the submission and necessary coordination with the action agencies and will ensure communication with the action agencies and BOEM no later than two business days after receiving Atlantic Shores' proposal and request for concurrence.<br>ii. If any of the SFV measurements indicate that the distances to level A thresholds for ESA listed whales (peak or cumulative) or PTS peak or cumulative thresholds for sea turtles are greater than the modeled distances (assuming 10 dB attenuation, see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23, 7.1.29), the clearance and shutdown zones (see Table 11.1) for subsequent jacket foundations must be increased so that they are at least the size of the distances to those thresholds as indicated by SFV (e.g., if threshold distances are exceeded on jacket foundation 1 then the clearance and shutdown zones for foundation 2 must be expanded). 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; Atlantic Shores must submit a proposed monitoring plan for NMFS GARFO's concurrence describing the proposed deployment of additional PSOs including the number of PSOs and location of all PSOs. In the event that the clearance or shutdown zone for sea turtles needs to be expanded, the proposed monitoring plan must also include a description of how additional PSOs will be deployed to ensure effective monitoring for sea turtles in the expanded zones.<br>iii. If after implementation of 2.b.i, any subsequent SFV measurements indicate that the distances to any identified isopleth of concern are still greater than those modeled assuming 10 dB attenuation (see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23, 7.1.29), Atlantic Shores must identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances; provide a written explanation to NMFS GARFO, BOEM, BSEE, and USACE supporting that determination and requesting concurrence to proceed; and, following NMFS GARFO's concurrence, deploy those additional measures or modifications on any subsequent jacket foundations that are installed (e.g., if threshold distances are exceeded on jacket foundation 2 then additional measures must be deployed before installing foundation 3). NMFS GARFO will strive to provide concurrence as quickly as possible following review of the submission and necessary coordination with the action agencies and will ensure communication with the action agencies and BOEM no later than two business days after receiving Atlantic Shores' proposal and request for concurrence. Clearance and shutdown zones must be expanded consistent with the requirements of 2.b.ii.<br>iv. Following installation of the foundation with additional, modified, and/or alternative noise attenuation measures or operational changes required by 2.b.iii, if SFV results indicate that any isopleths of concern are still greater than those modeled assuming 10 dB attenuation, before any additional piles can be installed, Atlantic Shores must identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances; provide a written explanation to NMFS GARFO, BOEM, BSEE, and USACE supporting that determination and requesting concurrence to proceed; and, following NMFS GARFO's concurrence, deploy those additional measures or modifications on any subsequent piles that are installed (e.g., if threshold distances are exceeded on jacket foundation 3 then additional measures must be deployed before installing foundation 4). Following concurrence from NMFS GARFO, BOEM, BSEE, and USACE must require and Atlantic Shores must implement those measures and any expanded clearance and shutdown zone sizes (and any required additional PSOs) consistent with the requirements of 2.b.ii. Additionally, BOEM, BSEE, and USACE must require and Atlantic Shores must continue SFV for two additional piles with enhanced sound attenuation measures and submit the interim reports as required above (for a total of at least three piles with consistent noise attenuation measures).<br>v. If no additional measures or modifications are identified for implementation, or if the SFV required by 2.b.iv indicates that the distance to any isopleths of concerns for any ESA-listed species are still greater than those modeled assuming | | |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | 10 dB attenuation, 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.<br>vi. Following installation of the jacket foundation with additional, alternative, or modified noise attenuation measures/operational changes required by 2.b.iii or 2.b.iv, if SFV results indicate that all isopleths of concern are within distances to isopleths of concern modeled assuming 10 dB attenuation (see Tables 7.1.8, 7.1.9, 7.1.10, 7.1.23, 7.1.29), SFV must be conducted on two additional jacket foundations (for a total of at least three jacket foundations with consistent noise attenuation measures). If the SFV results from all three of those foundations are within the distances to isopleths of concern modeled assuming 10 dB attenuation, then BOEM, BSEE, and USACE must require, and Atlantic Shores must continue to implement the approved additional, alternative, or modified sound attenuation measures/operational changes: BOEM, BSEE, USACE and/or Atlantic Shores can request concurrence from NMFS GARFO to the original clearance and shutdown zones (Table 11.1) or Atlantic Shores can continue with the expanded clearance and shutdown zones with additional PSOs.<br>c. Abbreviated SFV Monitoring (consisting of a single acoustic recorder, consisting of a bottom and midwater hydrophone, placed at an appropriate distance from the pile) must be performed on all pile-driven foundation installations for which the complete/thorough SFV monitoring outlined in 2a and 2b is not carried out. Abbreviated SFV is intended to provide a means of monitoring attenuated sound produced during pile driving and to provide an indication of whether sound is louder than anticipated, which can allow for adjustments to be made to noise attenuation measures or pile driving operations. Results of abbreviated SFV monitoring must be included in the weekly pile driving reports. If results of abbreviated SFV monitoring indicate that distances to the identified Level A and Level B harassment thresholds for whales or distances to injury or behavioral disturbance distances for sea turtles or Atlantic sturgeon may have been exceeded during the pile-driving event, Atlantic Shores must notify NMFS GARFO as soon as possible after receiving such results, and in the weekly report must include an explanation of suspected or identified factors that contributed to the potential exceedance and corrective actions that were taken, or planned to be taken, to avoid potential exceedance on subsequent piles. Additional action may include adjustments or additions to the noise attenuation system or pile driving operations and/or additional thorough SFV monitoring. BOEM, BSEE, USACE, and Atlantic Shores must meet and/or discuss with NMFS GARFO within two business days of Atlantic Shores' submission of a report that includes an exceedance to discuss if any additional action is necessary, unless an alternative timeline is agreed to by NMFS GARFO.<br>d. Atlantic Shores must inspect and carry out appropriate maintenance on the noise attenuation system prior to every pile driving event (i.e., for each pile driven foundation) and prepare and submit a NAS inspection/performance report. For piles for which thorough SFV is carried out, this report must be submitted as soon as it is available, but no later than when the interim SFV report is submitted for the respective pile. Performance reports for all subsequent piles must be submitted with the weekly pile driving reports. All reports must be submitted by email to nmfs.gar.incidental-take@noaa.gov.<br>i. 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 (CFM) and model number), number of operational compressors, performance data from each compressor (including Revolutions Per Minute (RPM), pressure, start times, and stop times), free air delivery ($m^3$/min), total hose air volume ($m^3$/(min m)), schematic of GPS 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), 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 all pile driving. | | |
| T&C 3 | C, O&M, D | Reporting requirements | To implement the requirements of RPM 2, the following conditions must be implemented:<br>a. BOEM, BSEE, and/or USACE must require that the Lessee document and report Project vessel trips to/from ports in the Delaware River, including the number of vessel calls to the Paulsboro Marine Terminal, New Jersey Wind Port, and Repauno. This must be included in the monthly Project reports submitted to NMFS GARFO over the life of the Project (see | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, NMFS, and USACE |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | Term and Condition 6.g. below). An annual summary of Project vessel calls to these ports must be submitted to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) and the USACE Philadelphia District (NAPRegulatory@usace.army.mil).<br>b. BOEM, BSEE, and/or USACE must ensure that the Lessee is aware of and complies with the following reporting requirements for all Project vessels transiting to/from ports in the Delaware River:<br>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.<br>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.<br>iii. Complete procedures for genetic sampling of any collected dead Atlantic sturgeon that are over 75 centimeters. More information on collecting and submitting genetic samples is included in Term and Condition 6a below. | | |
| T&C 4 | C, O&M, D | Reporting requirements | To implement the requirements of RPM 3, the Lessee must 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. This report must be filed within 48 hours of the incident and include the following: duration of pile driving 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 shutdown. 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). | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, NMFS, and USACE |
| T&C 5 | C | Review of Plans | To implement the requirements of RPM 3, BOEM, BSEE, USACE, and the Lessee must implement the following reporting requirements necessary to document the amount or extent of incidental take that occurs during all phases of the Proposed Action:<br>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 Atlantic Shores 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 DPS 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: we expect 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.<br>b. If a North Atlantic right whale is observed at any time by PSOs or Project personnel, the Lessee must ensure the sighting is immediately reported to NMFS. If immediate reporting is not possible, the report must be made within 24 hours of the sighting.<br>i. The report must be made to the appropriate geographic reporting line:<br>• If in the Northeast Region (ME to VA/NC border) call (866-755-6622).<br>• If in the Southeast Region (NC to FL) call (877-WHALE-HELP or 877-942-5343).<br>• If calling the hotline is not possible, reports can also be made to the U.S. Coast Guard via channel 16 or through the WhaleAlert app (http://www.whalealert.org/).<br>The sighting report must include the time (note time format, e.g., UTC, EST), date, and location (latitude/longitude in decimal degrees) of the sighting, number of whales, animal description/certainty of sighting (provide photos/video if taken), lease area/project name, PSO/personnel name, PSO provider company (if applicable), and reporter's contact information.<br>ii. If a North Atlantic right whale is detected at any time by PSOs/PAM Operators via PAM, the Lessee must ensure the detection is reported as soon as possible and no longer than 24 hours after the detection to NMFS via the 24-hour | ESA-listed Fish, Marine Mammals, Sea Turtles | BOEM, BSEE, NMFS, and USACE |

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| | | | North Atlantic right whale Detection Template (https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates). Calling the hotline is not necessary when reporting PAM detections via the template.<br>iii. A summary report must be sent within 24 hours to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov), NMFS OPR (PR.ITP.MonitoringReports@noaa.gov), and NMFS-NEFSC (ne.rw.survey@noaa.gov) with the above information and confirmation the sighting/detection was reported to the respective hotline, the vessel/platform from which the sighting/detection was made, activity the vessel/platform was engaged in at time of sighting/detection, Project construction and/or survey activity ongoing at time of sighting/detection (e.g., pile driving, cable installation, HRG survey), distance from vessel/platform to animal at time of initial sighting/detection, closest point of approach of whale to vessel/platform, vessel speed, and any mitigation actions taken in response to the sighting.<br>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 an ESA-listed species, the Lessee must immediately report the incident to NMFS. If in the Greater Atlantic Region (ME-VA), call the NMFS Greater Atlantic Stranding Hotline (866-755-6622) and if in the Southeast Region (NC-FL), call the NMFS Southeast Stranding Hotline (877-942-5343). As well as notify BSEE (via TIMSWeb and notification email to protectedspecies@bsee.gov). Separately, the Lessee must immediately report the incident to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov), and if in the Southeast region (NC-FL), also to NMFS SERO (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 MMSI 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. | | |
| **Conservation Measures and Reasonable and Prudent Measures and Terms and Conditions from the USFWS Biological Opinion Issued December 1, 2023** | | | | | |
| **Conservation Measures** | | | | | |
| 1 | Project design, O&M | Turbine configuration and maintenance | Turbine Configuration:<br>a. The WTG design provides a wind turbine air gap (minimum blade tip elevation to the sea surface) to minimize collision risk to marine birds (e.g., roseate terns) that may fly close to the ocean surface.<br>b. The Lessee will remove marine debris caught on offshore project structures, when safe and practicable, to reduce the risk of bird entanglement (BA Table 2-6, Measure BIR-07).<br>c. The Lessee will reduce attraction to structures by using perch deterrents to the maximum extent practicable for offshore structures (BA Table 2-6, Measure BIR-04). To minimize attracting birds (e.g., roseate terns) to operating turbines, the Lessee must install bird perching-deterrent devices on WTGs and OSSs (BA Table 2-7, Measure 1.a). The Lessee must submit for BOEM, BSEE, and USFWS review, and for BOEM and BSEE approval, a Bird Deterrent Plan to discourage perching on offshore infrastructure by roseate terns and other marine birds. Prior to approval of the plan, BOEM and/or BSEE will ensure all Service comments have been addressed. The Bird Deterrent Plan must include the type(s) and locations of bird perching-deterrent devices, include a maintenance plan for the life of the projects, allow for modifications and updates as new information and technology become available, and track the efficacy of the deterrents. The Bird Deterrent Plan will be | Birds | BOEM, BSEE, and USFWS |

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| | | | based on best available science regarding the effectiveness of perching deterrent devices on minimizing collision risk. The location of bird-deterrent devices must be proposed by the Lessee based on best management practices applicable to the appropriate operation and safe installation of the devices. The Lessee must confirm the locations of bird deterrent devices as part of the as-built documentation it must submit with the Facility Design Report (BA Table 2-7, Measure 1.a). A draft Bird Deterrent Plan must be submitted at least 90 days before the start of WTG construction, and a final plan must be approved at least 30 days before the start of construction. | | |
| 2 | O&M | Offshore Lighting | The Lessee must comply with all FAA, USCG, and BOEM lighting, marking and signage requirements.<br>a. The Lessee will limit lighting during offshore operations to the minimum required by regulation and for safety, minimizing the potential for any light-driven attraction of birds (BA Table 2-6, Measure BIR-03).<br>b. The Lessee will use red flashing FAA lights on the WTGs instead of constant white light, to reduce further bird attraction, and consider Aircraft Detection Lighting System (ADLS) to significantly reduce the number of hours FAA lighting will be illuminated. (BA Table 2-6, Measure BIR-03). The Lessee must use an FAA-approved vendor for the ADLS, which will activate the FAA hazard lighting only when an aircraft is in the vicinity of the wind facility to reduce visual impacts at night. The Lessee must confirm the use of an FAA approved vendor for ADLS on WTGs and OSSs in the Fabrication and Installation Report. (BA Table 2-7, Measure 1.b).<br>c. The Lessee will use yellow flashing marine navigation lights on the WTGs, instead of constant white light, to reduce further bird attraction (BA Table 2-6, Measure BIR-03) and will use down-lighting and down-shielding to the maximum extent practicable (BA Table 2- 6, Measure BIR-06). The Lessee must light each WTG and OSS in a manner that is visible by mariners in a 360-degree arc around the WTG and OSS. To minimize the potential of attracting migratory birds, the top of each light will be shielded to minimize upward illumination (conditional on USCG approval) (BA Table 2-7, Measure 1.c). Coordination with USCG regarding maritime navigation lighting occurs post-COP approval, generally at least 120 calendar days prior to installation. The Lessee will apply to USCG to establish Private Aids to Navigation (PATON), which includes a lighting, marking, and signaling plan. The PATON application will include design specifications for maritime navigation lighting.<br>Following approval of the PATON by USCG, BOEM, BSEE, and the Service will work together to evaluate the USCG-approved navigation lighting system, in order to characterize the color, intensity, and duration of any light from maritime lanterns that is likely to reach the typical flight heights of listed birds, and will assess the degree to which the light is likely to attract or disorient listed birds. This information will be considered, as appropriate, in future estimates of projected collision levels (see Conservation Measure 4, below), in any future updates to the incidental take statement accompanying this BO, and in future iterations of the Compensatory Mitigation Plan (see Conservation Measure 7, below). | Birds | BOEM, BSEE, and USFWS |
| 3 | O&M | Collision risk model support | BOEM has funded the development of a Stochastic Collision Risk Assessment for Movement (SCRAM), which builds on and improves earlier collision risk modeling frameworks. The Service fully supports SCRAM as a scientifically sound method for integrating best available information to assess collision risk for the three listed bird species. The first generation of SCRAM was released in early 2023 and still reflects a number of consequential data gaps and uncertainties. BOEM has already committed to funding Phase 2 of the development of SCRAM.<br>We expect that the current limitations of SCRAM will decrease substantially over time as more tracking data is incorporated into the model (e.g., from more individual birds tagged in more geographic areas, improved bird tracking capabilities, and emerging tracking technologies), and as modeling methods and computing power continue to improve.<br>Via this conservation measure, BOEM commits to continue funding the refinement and advancement of SCRAM, or its successor, with the goal of continually improving the accuracy and robustness of collision mortality estimates. This commitment is subject to the allocation of<br>sufficient funds to BOEM from Congress. This commitment will remain in effect until one of the following occurs:<br>i. the Atlantic Shores South turbines cease operation;<br>ii. the Service concurs that a robust weight of evidence has demonstrated that collision risks to all three listed birds from Atlantic Shores South turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or<br>iii. The Service concurs that further development of SCRAM (or its successor) is unlikely to improve the accuracy or robustness of collision mortality estimates. | Birds | BOEM, BSEE, and USFWS |

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| 4 | O&M | Collision Risk Model Utilization | BOEM will work cooperatively with the Service to re-run the SCRAM model (or its successor) for the Atlantic Shores South Project according to the following schedule:<br>• At least annually for the first 3 years of WTG operation.<br>• At least every other year for years 4 to 10 of WTG operation (i.e., years 4, 6, 8, and 10).<br>• At least every 5 years between year 10 and the termination of WTG operation (i.e., years 15, 20, 25, and 30).<br>Between these regularly scheduled model runs, BOEM will also re-run the SCRAM model (or its successor) within 90 days of each major model release or update, and at any time upon request by USFWS or the Lessee, and at any time as desired by BOEM. Prior to each model run, BOEM and USFWS will reach agreement on model inputs based on best available science, and the agencies may opt for multiple model runs using a range of inputs to reflect uncertainties in the inputs.<br>The above schedule may be altered upon the mutual agreement of BOEM and USFWS. The schedule is subject to sufficient allocation of funds to BOEM from Congress. This commitment will remain in effect until one of the following occurs:<br>i. the Atlantic Shores South turbines cease operation;<br>ii. USFWS concurs that a robust weight of evidence has demonstrated that collision risks to all three listed birds from Atlantic Shores South turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or<br>iii. USFWS concurs that further model runs are unlikely to improve the accuracy or robustness of collision mortality estimates.<br>BOEM is currently undertaking a programmatic analysis of proposed offshore wind activities in the New York Bight, including activity on leases contiguous with Atlantic Shores Lease OCS-A 0499. To account for potential additive and synergistic effects of offshore wind infrastructure buildout across this section of the coast, BOEM will consider collision mortality estimates for Atlantic Shores South in its assessment of overall collision risk for the New York Bight. The periodic updating of collision mortality estimates for Atlantic Shores South, according to the above schedule, may eventually be integrated into a regional or coastwide adaptive monitoring and impact minimization framework. | Birds | BOEM, BSEE, and USFWS |
| 5 | C, O&M, D | Monitoring and Data Collection | In conjunction with BOEM and USFWS, Atlantic Shores has implemented an Avian and Bat Survey Plan that included digital aerial surveys and a satellite telemetry study of the rufa red knot to further characterize the WTA and support consultations (BA Table 2-6, Measure BIR-01). Atlantic Shores has also used Motus to track the offshore movement of nano-tagged bird species within the WTA, following Service guidance on how to integrate automated radio telemetry into pre- and post-construction monitoring plans for offshore wind farms (BA Table 2-6, Measure BIR-02).<br>The Lessee will develop and implement an avian post-construction monitoring plan for the offshore area (BA Table 2-6, Measure BIR-08). BOEM will require that Atlantic Shores develops and implements an Avian and Bat Post-Construction Monitoring Plan7 in coordination with USFWS, NJDEP, and other relevant regulatory agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring. Prior to commencing offshore construction activities, Atlantic Shores must submit an Avian and Bat Post-Construction Monitoring Plan for BOEM, BSEE, and Service review. BOEM and USFWS will review the Avian and Bat Post-Construction Monitoring Plan and provide any comments on the plan within 30 calendar days of its submittal. Atlantic Shores must resolve all comments on the Avian and Bat Post-Construction Monitoring Plan to BOEM and USFWS's satisfaction before implementing the plan (BA Table 2-7, Measure 3) and prior to the start of WTG operations. The objectives of the monitoring plan will include: (1) to advance understanding of how the target species utilize the offshore airspace and do (or do not) interact with the wind farm; (2) to improve the collision estimates from SCRAM (or its successor) for the three listed bird species; and (3) to inform any efforts aimed at minimizing collisions or other Project effects on target species.<br>a. Monitoring. Atlantic Shores must conduct monitoring as outlined in the Atlantic Shores South Bird and Bat Monitoring Framework, which will use radio tags to monitor movement of listed birds in the vicinity of the projects (BA Table 2-7, Measure 3.a). The Avian and Bat Post-Construction Monitoring Plan will allow for changing methods over time (see Conservation Measure 5.d, below) in order to regularly update and refine collision estimates for listed birds. The plan will include an initial monitoring phase involving deployment of Motus radio tags on listed birds in conjunction with installation | Birds | BOEM, BSEE, and USFWS |

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| | | | and operation of Motus receiving stations on turbines in the Lease Area following offshore Motus recommendations. The initial phase may also include deployment of satellite-based tracking technologies (e.g., GPS or Argos tags).<br>b. Annual Monitoring Reports. Atlantic Shores must submit to BOEM (at renewable_reporting@boem.gov), USFWS, and BSEE (via TIMSWeb with a notification email sent to protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within 12 months of completion of the last avian survey. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. BOEM, USFWS, and BSEE will use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the Avian and Bat Post-Construction Monitoring Plan. BOEM, BSEE, and USFWS reserve the right to require reasonable revisions to the Avian and Bat Post-Construction Monitoring Plan and may require new technologies as they become available for use in offshore environments (BA Table 2-7, Measure 3.b) (see Conservation Measure 5.d, below).<br>c. Post-Construction Quarterly Progress Reports. Atlantic Shores must submit quarterly progress reports during the implementation of the Avian and Bat Post-Construction Monitoring Plan to BOEM (at renewable_reporting@boem.gov), BSEE (via TIMSWeb with a notification email sent to protectedspecies@bsee.gov), and USFWS by the 15th day of the month following the end of each quarter during the first full year that the Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered (BA Table 2-7, Measure 3.c).<br>d. Monitoring Plan Revisions. Within 30 calendar days of submitting the annual monitoring report, Atlantic Shores must meet with BOEM and USFWS to discuss the following: the monitoring results; the potential need for revisions to the Avian and Bat Post-Construction Monitoring Plan, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If BOEM or USFWS determines after this discussion that revisions to the Avian and Bat Post-Construction Monitoring Plan are necessary, BOEM may require Atlantic Shores to modify the Avian and Bat Post-Construction Monitoring Plan. If the reported monitoring results deviate substantially from the impact analysis included in the Final BA, Atlantic Shores must transmit to BOEM recommendations for new mitigation measures and/or monitoring methods (BA Table 2-7, Measure 3.d).<br>The frequency, duration, and methods for various monitoring efforts in future revisions of the Avian and Bat Post-Construction Monitoring Plan will be determined adaptively based on current technology and the evolving weight of evidence regarding the likely levels of collision mortality for each listed bird species. The effectiveness and cost of various technologies/methods will be key considerations when revising the plan. Grounds for revising the Avian and Bat Post-Construction Monitoring Plan include, but are not limited to:<br>(i) greater than expected levels of collision of listed birds; (ii) evolving data input needs (as determined by BOEM and the Service) for SCRAM (or its successor); (iii) changing technologies for tracking or otherwise monitoring listed birds in the offshore environment that are relevant to assessing collision risk; (iv) new information or understanding of how listed birds utilize the offshore environment and/or interact with wind farms; and (v) a need (as determined by BOEM and USFWS) for enhanced coordination and alignment of tracking, monitoring, and other data collection efforts for listed birds across multiple wind farms/leases on the OCS.<br>BOEM will require Atlantic Shores to continue appropriate monitoring activities for listed birds (under the current and future versions of the Avian and Bat Post-Construction Monitoring Plan) until one of the following occurs: (i) the Atlantic Shores South turbines cease operation; (ii) USFWS concurs that a robust weight of evidence has demonstrated that collision risks to all three listed birds from Atlantic Shores South turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or (iii) USFWS concurs that further data collection is unlikely to improve the accuracy or robustness of collision mortality estimates and is unlikely to improve the ability of BOEM and Atlantic Shores to reduce or offset collision mortality (see Conservation Measure 7, below).<br>e. Operational Reporting (Operations). Atlantic Shores must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb with a notification email sent to protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition (SCADA) data for all turbines together in tabular format: the proportion of time the turbines were operational (spinning at >x rpm) each month, the average rotor speed (monthly revolutions per minute[rpm]) of spinning turbines plus 1 standard deviation, and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. Any operational data considered by the Lessee to be privileged or confidential must be clearly marked as confidential business information and will be handled by BOEM and BSEE in a manner consistent with 30 CFR 585.114. BOEM and BSEE will use this information as inputs for avian collision risk models to assess whether the results deviate substantially from the impact analysis included in this BO (BA Table 2-7, Measure 3.e). | | |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | f. Raw Data. Atlantic Shores 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. Atlantic Shores must work with BOEM to ensure the data are publicly available (BA Table 2- 7, Measure 3.f). All avian tracking data (i.e., from radio and satellite transmitters) will be stored, managed, and made available to BOEM and USFWS following the protocols and procedures outlined in the agency document entitled Guidance for Coordination of Data from Avian Tracking Studies, or its successor. | | |
| 6 | C, O&M, D | Incidental Mortality and Reporting | The Lessee will report any dead or injured birds to BOEM on an annual basis. Birds with USFWS bands will be reported to the USGS Bird Banding Lab (BBL) (BA Table 2-6, Measure BIR-09). The Lessee must provide an annual report to BOEM and USFWS documenting<br>any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. 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 BBL. Any occurrence of a dead listed bird or bat must be reported to BOEM, BSEE (via TIMSWeb with a notification email sent to protectedspecies@bsee.gov), and USFWS as soon as practicable (taking into account crew and vessel safety), ideally within 24 hours and no more than 3 days after the sighting. If practicable, the dead specimen will be carefully collected and preserved in the best possible state, contingent on the acquisition of the necessary wildlife permits and compliance with the Lessee's health and safety standards (BA Table 2-7, Measure 4). Also see Monitoring Requirements at the end of this BO. | Birds | BOEM, BSEE, and USFWS |
| **Reasonable and Prudent Measures and Terms and Conditions** | | | | | |
| 1 | Pre- O&M and O&M | Collision Detection Report | Periodically review current technologies and methods for detecting collisions of listed birds, including but not limited to: Motus stations, remote sensing, cameras, microphones, Doppler and NEXTRAD radar, and eDNA.<br>a. Prior to the start of WTG operations at Atlantic Shores South, BOEM must extract from existing project documentation (e.g., the BA, other consultation documents, the final Environmental Impact Statement, the COP) a stand-alone summary of technologies and methods that were evaluated by BOEM to detect, reduce, or minimize bird collisions at the Atlantic Shores South WTGs.<br>b. Within 5 years of the start of WTG operation, and then every 5 years for the life of the project, BOEM must prepare a separate Collision Detection Report, reviewing best available scientific and commercial data on technologies and methods that have been implemented, or are being studied, to detect bird collisions at WTGs. The review must be global in scope and include both offshore and onshore WTGs.<br>c. BOEM must distribute a draft Collision Detection Report to the Service, BSEE, the Lessee, NJDEP, and the New Jersey Board of Public Utilities for a 60-day review period. BOEM must address all comments received during the review period and issue the final reports within 60 days of the close of the review period.<br>d. Following issuance of the final report, USFWS may request a meeting. Within 60 days of receiving the request, BOEM must convene a meeting with USFWS, BSEE, and the Lessee to discuss the reports and whether implementation of any technologies/methods is appropriate. | Birds | BOEM, BSEE, and USFWS |
| 2 | Pre- O&M and O&M | Collision Minimization Report | Periodically review current technologies and methods for minimizing collision risk of listed birds, including but not limited to: WTG coloration/marking, lighting, avian deterrents, and limited WTG operational changes.<br>a. Prior to the start of WTG operations at Atlantic Shores South, BOEM must extract from existing Project documentation (e.g., the BA, other consultation documents, the final Environmental Impact Statement, the COP) a stand-alone summary of technologies and methods that were evaluated by BOEM to detect, reduce, or minimize bird collisions at the Atlantic Shores South WTGs.<br>b. Within 5 years of the start of WTG operation, and then every 5 years for the life of the 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 WTGs. The review must be global in scope and include both offshore and onshore WTGs.<br>c. BOEM must distribute a draft Collision Minimization Report to USFWS, BSEE, the Lessee, NJDEP, and the New Jersey Board of Public Utilities for a 60-day review period. BOEM must address all comments received during the review period and issue the final reports within 60 days of the close of the review period. | Birds | BOEM, BSEE, and USFWS |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | d. Following issuance of the final report, USFWS may request a meeting. Within 60 days of receiving the request, BOEM must convene a meeting with USFWS, BSEE, and the Lessee to discuss the reports and whether implementation of any technologies/methods is appropriate. | | |
| **DoD Measures Resulting from Military Aviation and Installation Assurance Siting Clearinghouse Review** | | | | | |
| 1 | C, O&M | NORAD notification and Radar adverse impact management (RAM) | • The Lessee will notify NORAD 30–60 days ahead of Project completion.<br>• The Lessee will notify NORAD when the Project is complete and operational for RAM scheduling.<br>• The Lessee will contribute $80,000 toward the execution of the RAM for each affected radar, for a total contribution of $160,000.<br>• The Lessee will curtail when necessary for National Security or Defense Purposes as described in the agreement executed between BOEM and the Lessee for lease of the Project site. | Radar Systems | DoD |
| 2 | Pre-C, C | Distributed optical fiber sensing (DOFS) and acoustic monitoring | • To enable the Project to proceed pending the results of the DoD DOFS or acoustic monitoring technical evaluation, the Lessee will agree that DoD retains the right to unilaterally require the Lessee to implement mitigation measures that are necessary to safeguard against potential threats to national security and military operations as identified by DoD.<br>• The Lessee will provide to DoD all information necessary for evaluating the potential for the submarine power and data cables to be used in the Project and planned deployment of acoustic monitoring devices. Required information includes sensor deployment dates and duration; siting routes and locations of acoustic monitoring devices; shore station location; DOFS and acoustic monitoring capabilities; make and model of integrated and standalone scientific sensors, including those planned for future integration and/or deployment; manufacturers; vendors; plans for data storage; transmission and usage; and associated physical and cybersecurity protocols. This information must be provided no later than 240 days prior to deployment of such equipment. If DoD requests additional information, the Lessee will provide it within 15 calendar days of the request.<br>• Notice of the intent to make changes to any of the above items or approaches (e.g., intent to change the location of an acoustic monitoring device) must be provided to DoD at least 30 calendar days prior to any change. DoD shall have 180 calendar days from completion of the DOFS and acoustic monitoring technical evaluation of the information provided to determine whether the Lessee's planned use of submarine data, power cables, acoustic monitoring devices, and all related or similar equipment associated with the project poses a threat to national security or military operations and, accordingly, whether mitigation measures are required. Upon such determination, DoD will notify the Lessee and the Lessee will implement the required mitigation measures within 30 calendar days of notification by DoD.<br>• On completion of each acoustic monitoring platform, the Lessee will provide DoD with as-built schematics and diagrams showing the exact makes and models of all DOFS equipment used, which will be updated within 10 business days of any change. | Radar Systems | DoD |
| 3 | Pre-C | DoD Reporting and Implementation | The Lessee must enter into an additional mitigation agreement with DoD, for purposes of ensuring submarine data, power cables, or acoustic monitoring devices will not be used for DOFS to detect sensitive data from DoD activities, or for any other type of surveillance of U.S. Government operations. Any mitigation measures required will be further detailed in the mitigation agreement between the Lessee and the DoD and may include, but are not limited to, the following:<br>• Lessee appointment of a DoD approved Security Officer, subject to citizenry and other requirements, to monitor compliance with mitigation measures.<br>• Restrictions on DOFS or acoustic monitoring equipment operating modes, parameters, and/or capabilities. These may include programmed modes to avoid distributed sensing on specified portions of a cable when required by DoD.<br>• Equipment and component restrictions and requirements, to include prohibitions on usage, installation, or connection of equipment or components manufactured in specified foreign countries. No equipment may be used on the Project if banned by any agency of the United States.<br>• Physical and cybersecurity protections at, and Government inspections of, locations where Lessee's DOFS equipment and components, and acoustic monitoring devices are installed and monitored.<br>• Temporary or permanent shutdown or data diversion of cable distributed sensing or acoustic monitoring in sensitive locations, as determined and required by DoD.<br>• Reporting requirements for Lessee and subcontractor reporting requirements concerning business and ownership relationships with foreign entities and use of non-citizens for installation and maintenance work. | Radar Systems | DoD |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | • Lessee and subcontractor reporting requirements concerning business and ownership relationships with foreign entities and use of non-citizens for installation and maintenance work. | | |
| 4 | Pre-C | National Security Review | • Within 45 days following approval of the COP, the Lessee will provide DoD with the names of each entity and person having beneficial ownership or control of 5 percent or more of the lease owner and the Project operator, all material vendors and manufacturers who will regularly visit the Project, who supply or manufacture equipment used on the Project, control equipment used on the Project, or have access to associated data systems. In addition, such information will be provided for each director and the top five executives of the lease owner and Project operator.<br>○ For persons identified, the following information must be provided: Full legal name, date of birth, country of citizenship, and permanent address.<br>• The Lessee and DoD will establish a process to review additional entities not previously reviewed during the initial screening, based on when the information will be available during the Project planning process. This process will include Lessee provision to DoD of information regarding any foreign entities and persons allowed to access the wind turbine structures and associated data systems.<br>• DoD will screen the names of the entities and persons identified. Once submitted for screening, DoD Parties will identify to the Lessee, no later than 60 days after the receipt of the name of any entity and person posing a security concern.<br>• The Lessee agrees to provide written notice to the DoD Parties at least 45 days in advance of Lessee's intended use of any material vendor not previously screened pursuant to this section. The Lessee will allow the DoD 45 days following such notice to conduct a security review and assess any security concern. Notwithstanding the foregoing, the Lessee need not wait 45 days if an unexpected situation arises for which employing services or vendors immediately is prudent for the safe operation of the Project.<br>• In any case in which the DoD identifies any entity and any person screened in accordance with this section as posing a national security concern, the Lessee agrees to enter into negotiations with DoD to mitigate any threat to national security that arises as a result of the proximity of any entity and person posing a national security concern to military activities. Except in unexpected situations as previously described, the threat to national security must be resolved to the satisfaction of the DoD Parties prior to allowing access to the site or its associated data systems by representatives of any entity and person posing a national security concern or the use of wind turbines or other permanent onsite equipment or associated data systems manufactured by any entity and person posing a national security concern. In any case in which an entity and person is identified as posing a national security concern following an unexpected situation, the threat to national security must be resolved to the satisfaction of DoD at the earliest opportunity. | Radar Systems | DoD |
| 5 | Pre-C, C | Deconfliction of activities | DoD requests the Lessee coordinate with DoD ocean users and schedulers during construction and major maintenance activities to avoid conflicts. | Navigation and Vessel Traffic, Radar Systems | N/A – best practice |
| **NHPA Section 106 Mitigation and Monitoring Measures** | | | | | |
| 1 | Pre-C, C, O&M, D | Compliance with Section 106 Memorandum of Agreement | The Lessee will comply with stipulations of *The Memorandum of Agreement Among the Bureau of Ocean Energy Management, The Delaware Nation, The Delaware Tribe of Indians, The Mashantucket (Western) Pequot Tribal Nation, The Mashpee Wampanoag Tribe, The Shinnecock Indian Nation, The Stockbridge-Munsee Community Band of Mohican Indians, The State Historic Preservation Officer of New Jersey, The New Jersey Historic Trust, Atlantic Shores Offshore Wind Project 1, LLC, and Atlantic Shores Offshore Wind Project 2, LLC, and the Advisory Council on Historic Preservation Regarding the Atlantic Shores Offshore Wind South Project* (hereafter referred to as the MOA) as developed by BOEM through NHPA Section 106 consultations with federally recognized Tribes, New Jersey HPO, ACHP, and consulting parties to resolve adverse effects on historic properties. As defined in the Section 106 regulations, consulting parties include those who are property owners of or have demonstrated interest in the historic properties BOEM has determined would be adversely affected by the Project. | Cultural | BOEM, BSEE, USACE, ACHP, NJDEP, and NJHPO |
| 2 | C | Avoidance of Adverse Effects on Historic Properties in Marine Area of Potential Effect | Per MOA Stipulation I.A.1, the Lessee will comply with protective buffers recommended by the Qualified Marine Archaeologist (QMA) for all 22 identified marine archaeological resources to avoid adverse effects on these historic properties in the marine APE. | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| 3 | C | Archaeological Monitoring in the Marine Area of Potential Effects | Per MOA Stipulation XII, the Lessee will implement a construction monitoring program consistent with the monitoring plan for marine archaeology (MOA, Attachment 4). | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Mitigation and Monitoring Measures Resulting from Consultations | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| 4 | Pre-C | Funding and Implementation of Historic Properties Treatment Plans for Historic Properties in the Marine Area of Potential Effects | Per MOA Stipulation III.A.1 and the associated HPTP (MOA, Attachment 7), the Lessee will implement the measures described in the HPTP and fund these measures per the agreed-upon amounts in *Mitigation Funding Amounts* (Attachment 6) to resolve adverse effects on historic properties in the marine APE. | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| 5 | C | Marine Archaeology Post-Review Discovery Plan | Per MOA Stipulation XIII, if historic properties are discovered that may be historically significant or unanticipated effects on historic properties are found, or in the event of a post-review discovery of a historic property or unanticipated effects on a historic property prior to or during construction, installation, O&M, or decommissioning of the Project, the Lessee will implement the actions described in the post-review discovery plan (PRDP) for marine archaeology (MOA, Attachment 4). | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| 6 | C | Archaeological Monitoring in the Terrestrial Area of Potential Effects | Per MOA Stipulation I.A.2 and Stipulation XII, the Lessee will implement a construction monitoring program consistent with the monitoring plan for terrestrial archaeology (MOA, Attachment 5). | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| 7 | C | Terrestrial Archaeology Post-Review Discovery Plan | Per MOA Stipulation XIII, if historic properties are discovered that may be historically significant or unanticipated effects on historic properties are found, or in the event of a post-review discovery of a historic property or unanticipated effects on a historic property prior to or during construction and installation, O&M, or decommissioning of the Project, the Lessee will implement the actions described in the PRDP for terrestrial archaeology (MOA, Attachment 5). | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| 8 | Pre-C | Contribution to a Mitigation Fund | Per MOA Stipulation III.C.1.i, the Lessee will make contributions to a Mitigation Fund per the agreed-upon amounts in *Mitigation Funding Amounts* (Attachment 6) to resolve adverse effects on historic properties in the visual APE. As applicable and specified in the MOA, this will be required in lieu of or in addition to the funding and implementation of HPTPs per Stipulation III.C.1.ii. | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |
| 9 | Pre-C | Funding and Implementation of Historic Properties Treatment Plans for Historic Properties in the Visual Area of Potential Effects | Per MOA Stipulation III.C.1.ii and the associated HPTPs, the Lessee will implement the measures described in the HPTPs and fund these measures per the agreed-upon amounts in *Mitigation Funding Amounts* (Attachment 6) to resolve adverse effects on historic properties in the visual APE. As applicable and specified in the MOA, this will be required in lieu of or in addition to contributions to a Mitigation Fund per Stipulation III.C.1.i. | Cultural | BOEM, BSEE, USACE, NJDEP, and NJHPO |

**Table G-3. Additional mitigation and monitoring measures**

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Additional Mitigation and Monitoring Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| **BOEM-Proposed Mitigation Measures** | | | | | |
| 1 | Pre-C, C, O&M, D | $SF_6$-free switchgear | The Lessee must use switchgear that does not contain $SF_6$ to the extent practicable based on technical, economic, and supply chain considerations.<br><br>BOEM is proposing additional mitigation requirements to minimize $SF_6$ emissions in the event that the applicant is not able to use $SF_6$-free switch gear. The additional mitigation is as follows:<br>• Follow manufacturer recommendations for limiting leaks and for service and repair of the affected breakers and switches.<br>• Perform repairs promptly when significant leaks are detected.<br>• Conduct visual inspections of the switchgear and monitoring equipment according to manufacturer recommendations.<br>• Create alarms based on the pressure readings in the breakers and switches, so leaks can be detected when substantial $SF_6$ leakage occurs. Upon a detectable pressure drop that is >10% of the original pressure (accounting for ambient air conditions), perform maintenance to fix seals as soon as feasible. If an event requires removal of $SF_6$, the affected major component(s) will be replaced with new component(s). An event means when any component of a switchgear is damaged and results in $SF_6$ leakage.<br>• Capture and recycle any $SF_6$ removed from breakers and switches during maintenance.<br>• Keep a log of all detected leaks and maintenance procedures potentially affecting $SF_6$ emissions from circuit breakers/switches. | Air Quality | BOEM, BSEE, and USEPA |
| 2 | O&M | Fisheries compensation /mitigation fund | Prior to construction and determined in the COP approval, the Lessee shall establish a compensation/mitigation fund (Fund) consistent with BOEM's draft[4] 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 data provided in this EIS. For losses to shoreside businesses, the Lessee shall analyze the impacts to shoreside seafood businesses adjacent to ports listed in Table 3.6.1-16. Shoreside business impacts may include (but are not limited to):<br>• Fishing gear suppliers and repair services;<br>• Vessel fuel and maintenance services;<br>• Ice and bait suppliers;<br>• Seafood processors and dealers; and<br>• Wholesale distributors.<br>The Lessee will be required to provide BOEM with their analysis (including any model outputs, such as an IMPLAN model or other economic report) verifying the exposed impacts to shoreside businesses and services. The Lessee must submit to BOEM a report that includes (1) a description of the structure of the Fund and its consistency with BOEM's draft Guidance and (2) an analysis of the impacts of the Project on shoreside businesses, for a 45-day review and comment period at least 90 days prior to establishment of the Fund. The Lessee must resolve all comments on the report to BOEM's satisfaction before implementation of the Fund. The Lessee must then submit to BOEM evidence of the implementation of the Fund, including:<br>• A description of any implementation details not covered in the report to BOEM regarding the mechanism established to compensate for losses to commercial and for-hire recreational fishermen and related shoreside businesses resulting from all phases of the project development on the Lease Area (pre-construction, construction, operation, and decommissioning);<br>• The Fund charter, including the governance structure, audit and public reporting procedures, and standards for paying compensatory mitigation for impacts to fishers and related shoreside businesses from lease area development; and<br>• Documentation regarding the funding account, including the dollar amount, establishment date, financial institution, and owner of the account. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM and BSEE |

[4] Draft Guidance shall be superseded by Final Guidance, if Final Guidance is published by the signing of the ROD for the Project.

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Additional Mitigation and Monitoring Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| 3 | Pre-C, C, O&M | High-frequency radar interference | HF-radar Interference Analysis and Mitigation<br>• The Lessee's Project has the potential to interfere with oceanographic high-frequency (HF) radar systems in the U.S. Integrated Ocean Observing System (IOOS®), which is managed by the IOOS Office within the National Oceanic and Atmospheric Administration (NOAA) pursuant to the Integrated Coastal and Ocean Observation System Act of 2009 (Pub. L. No. 111-11), as amended by the Coordinated Ocean Observation and Research Act of 2020 (Pub. L. No. 116-271, Title I), codified at 33 U.S.C. 3601–3610 (referred to herein as "IOOS HF-radar"). IOOS HF-radar measures the sea state, including ocean surface current velocity and waves in near real time. These data have many vital uses ("mission objectives"), including tracking and predicting the movement of spills of hazardous materials or other pollutants, monitoring water quality, and predicting sea state for safe marine navigation. USCG also integrates IOOS HF-radar data into its Search and Rescue systems. The Lessee's Project is within the measurement range of 8 IOOS HF-radar systems operated by Rutgers University in: Brant Beach, NJ; Brigantine, NJ; Hempstead, NY; Loveladies, NJ; North Wildwood, NJ; Seaside Park, NJ; Strathmere, NJ; and Wildwood, NJ.<br>○ Mitigation Requirement<br>Due to the potential interference with IOOS HF-radar and the risk to public health, safety, and the environment, the Lessee must mitigate unacceptable interference with IOOS HF-radar from the Lessee's Project. Interference must be mitigated before commissioning the first WTG or blades start spinning, whichever is earlier, and interference mitigation must continue throughout operations and decommissioning until the point of decommissioning where all rotor blades are removed. Interference is considered unacceptable if, as determined by BOEM in consultation with NOAA's IOOS Office, IOOS HF-radar performance falls or may fall outside any of the specific radar systems' operational parameters or fails or may fail to meet IOOS's mission objectives.<br>○ Mitigation Review<br>The Lessee must submit to BOEM documentation demonstrating how it will mitigate unacceptable interference with IOOS HF-radar systems in accordance with the Mitigation Requirement. The Lessee must submit this documentation to BOEM (renewable_reporting@boem.gov) at least 120 days prior to commissioning the first WTG or blades start spinning, whichever is earlier. If, after consultation with the NOAA IOOS Office, BOEM deems the mitigation acceptable, the Lessee must conduct activities in accordance with the proposed mitigations. If, after consultation with NOAA IOOS Office, BOEM deems the mitigation unacceptable, the Lessee must resolve all comments on the documentation to BOEM's satisfaction.<br>○ Mitigation Agreement<br>The Lessee is encouraged to enter into an agreement with the NOAA IOOS Office to implement mitigation measures, and any such Mitigation Agreement may satisfy the requirement to mitigate unacceptable interference with IOOS HF-radar. The point of contact for the development of a Mitigation Agreement with the NOAA IOOS Office is the Surface Currents Program Manager, whose contact information is available at https://ioos.noaa.gov/about/meet-the-ioos-program-office/ and upon request from BOEM. If the parties reach a mitigation agreement, the Lessee must submit it to BOEM at renewable_reporting@boem.gov. The Lessee may satisfy its obligations under Section 1.2 by providing BOEM with an executed Mitigation Agreement between the Lessee and NOAA IOOS. If there is any discrepancy between Section 1.2 and the terms of a Mitigation Agreement, the terms of the Mitigation Agreement will prevail.<br>○ Mitigation Data Requirements<br>Mitigation required under Section 1.2 must address the following:<br>▪ Before commissioning the first WTG or blades start spinning, whichever is earlier, and continuing throughout the life of the Lessee's Project until the point of decommissioning when all rotor blades are removed, the Lessee must make publicly available via NOAA IOOS near real-time, accurate numerical telemetry of surface current velocity, wave height, wave period, wave direction, and other oceanographic data measured at the Lessee's Project locations selected by the Lessee in coordination with the NOAA IOOS Office.<br>▪ If requested by the NOAA IOOS Office, the Lessee must share with IOOS accurate numerical time-series data of blade rotation rates, nacelle bearing angles, and other information about the operational state of each WTG in the Lessee's Project to aid interference mitigation.<br>○ Additional Notification and Mitigation<br>▪ If at any time the NOAA IOOS Office or an HF-radar operator informs the Lessee that the Lessee's Project will cause unacceptable interference to an HF-radar system, the Lessee must notify BOEM of the determination | Radar Systems | BOEM and NOAA IOOS Office |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Additional Mitigation and Monitoring Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | and propose new or modified mitigation pursuant to Section 1.5.2 as soon as possible and no later than 30 days from the date on which the determination was communicated.<br>▪ If a mitigation measure other than that identified in Section 1.2 is proposed, then the Lessee must submit information on the proposed mitigation measure to BOEM for its review and concurrence. If, after consultation with the NOAA IOOS Office, BOEM deems the mitigation acceptable, the Lessee must conduct activities in accordance with the proposed mitigations. The Lessee must resolve all comments on the documentation to BOEM's satisfaction, in consultation with the NOAA IOOS Office, prior to implementation of the mitigation. | | |
| 4 | Pre-C, C, O&M, D | Fisheries survey mitigation | There are 14 NMFS scientific surveys that overlap with wind energy development in the northeast region. Eleven of these surveys overlap with the Project. Consistent with NMFS and BOEM survey mitigation strategy actions 1.3.1, 1.3.2, 2.1.1, and 2.1.2 in the *NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy - Northeast US Region,* within 1 year plus 120 days of COP approval, the Lessee must submit to BOEM a survey mitigation agreement between NMFS and the Lessee. The survey mitigation agreement must describe how the Lessee will mitigate the Project impacts on the 11 NMFS surveys. The Lessee must conduct activities in accordance with such agreement.<br>If the Lessee and NMFS fail to reach a survey mitigation agreement, then the Lessee must submit a Survey Mitigation Plan to BOEM and NMFS that is consistent with the mitigation activities, actions, and procedures described below, within 1 year plus 180 days of COP approval. BOEM will review the Survey Mitigation Plan in consultation with NMFS NEFSC, and the Lessee must resolve comments to BOEM's satisfaction and must conduct activities in accordance with the plan.<br>• As soon as reasonably practicable, but no later than 30 days after the issuance of the Project's COP approval, the Lessee must initiate coordination with NMFS NEFSC to develop the survey mitigation agreement described above. Mitigation activities specified under the agreement must be designed to mitigate the Project impacts on the following NMFS NEFSC surveys: (a) Spring Bottom Trawl survey; (b) Autumn Multi-species Bottom Trawl survey; (c) Ecosystem Monitoring survey; (d) Aerial marine mammal and sea turtle survey; (e) Shipboard marine mammal and sea turtle survey; (f) Atlantic surfclam and ocean quahog survey; (g) Atlantic sea scallop survey; and (h) Seal survey. At a minimum, the survey mitigation agreement must describe actions and the means to address impacts on the affected surveys due to the preclusion of sampling platforms and impacts on statistical designs. NMFS has determined that the project area is a discrete stratum for surveys that use a random stratified design. This agreement may also consider other anticipated Project impacts on NMFS surveys, such as changes in habitat and increased operational costs due to loss of sampling efficiencies.<br>• The survey mitigation agreement must identify activities that will result in the generation of data equivalent to data generated by NMFS's affected surveys for the duration of the Project. The survey mitigation agreement must describe the implementation procedures by which the Lessee will work with NEFSC to generate, share, and manage the data required by NEFSC for each of the surveys impacted by the Project, as mutually agreed upon between the Lessee and NMFS NEFSC. The survey mitigation agreement must also describe the Lessee's participation in the NMFS NEFSC Northeast Survey Mitigation Program to support activities that address regional-level impacts for the surveys listed above. | Commercial Fisheries and For-Hire Recreational Fishing | BOEM and BSEE |
| 5 | Pre-C, C, O&M, D | Navigational Safety | No permanent structures will be placed in a way that narrows any linear rows and columns to fewer than 0.6 nautical mile (1.1 kilometers) by 1.0 nautical mile (1.9 kilometers) or in a layout that eliminates two distinct lines of orientation in a grid pattern. The Project's proposed OSSs, met tower, and WTGs will be aligned in a uniform grid with rows in an east-northeast to west-southwest direction spaced 1.0 nautical mile (1.9 kilometers) apart and rows in an approximately north to south direction spaced 0.6 nautical mile (1.1 kilometers) apart. | Commercial Fisheries and For-Hire Recreational Fishing, Navigation and Vessel Traffic, Other Uses – Marine and Military Activities | BOEM and BSEE |
| 6 | C | Sound field verification of foundation installation | The purpose of the SFV process is to document sound propagation from foundation installation for estimating distances to isopleths of potential injury and harassment to verify that the modeled acoustic fields were conservative enough to not underestimate the number of exposures of protected marine life to sounds over regulatory thresholds.<br>In order to compare sound fields produced by the full variation in planned installation scenarios with those modeled, for all piles, the Lessee must perform "abbreviated" SFV by placing a single recorder 2,460 feet (750 meters) from the foundation. The Lessee must also perform "thorough monitoring" (defined as recording along a minimum of two radials with at least one radial containing recorders at three or more distances) for the first three foundation installations of the Project, on the first installation in each subsequent calendar year, and for the installation of any subsequent foundation planned to have a different combination of the following parameters: foundation type, pile size, installation method, hammer energy rating, | Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM, BSEE, NMFS, and USACE |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Additional Mitigation and Monitoring Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | water depth, seabed composition, season. The combination of "thorough" and "abbreviated" SFV is critical to ensure that additional inherent variability does not result in received levels above what was analyzed within the permitting process.<br>If levels measured in any SFV (thorough or abbreviated) imply the exceedance of authorized ranges to regulatory thresholds, thorough SFV must be conducted until SFVs from three consecutive foundations demonstrate adherence to the authorized levels following a foundation that exceeded said limit. Further, the lessee must comply with other Terms and Conditions directing action should SFV-measured ranges exceed those authorized. See Chapter three of *BOEM Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans* for more information.<br>The Lessee must submit an SFV plan for review and written approval by USACE, BOEM, BSEE (TIMS), and NMFS 120 days before the planned commencement of field activities for pile driving. The plan must include measurement procedures and results reporting that meet ISO standard 18406:2017 (Underwater acoustics – Measurement of radiated underwater sound from percussive pile driving). The Lessee will be required to send raw acoustic data to the National Centers for Environmental Information (with a copy sent to BOEM) within 90 days after the pile-driving season has ended, and regular SFV reports shall be submitted throughout the pile-driving season. The Lessee must follow the approved plan.<br>The SFV plan should include approximations of the expected variation of key parameters (e.g., foundation type, pile size, installation method, hammer energy rating, water depth, seabed composition, and season) across the Project and an estimate of how many thorough monitoring locations will be required to cover this variation. The plan must describe how the Lessee will ensure that the locations selected for thorough monitoring are representative of the rest of the foundations of that type to be installed. The SFV process must be sufficient to assess sound propagation from the foundation and the distances to isopleths for potential injury and harassment. The measurements must be compared to the modeled Level A and Level B harassment zones for marine mammals (and the injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon), thus the plan should include the target modeled sound levels that each monitored installation will stay below. | | |
| 7 | Pre-C, C, O&M | Long-term PAM | Highly migratory species like baleen whales occupy different parts of the Atlantic OCS at different times of the year. Passive Acoustic Monitoring (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. Autonomous PAM systems can be deployed for months at a time and should be configured to record low-frequency sounds (capable of detecting baleen whales and industry-related noise) on a continuous basis; this ensures that species which call in "bouts" do not go undetected. These acoustic recordings are then processed using automatic detection methods to document the presence of particular species. Linking together the time-series of baleen whale detections with other oceanographic data, such as water temperature and plankton abundance, can tell a more complete story about habitat use over space and time. These comparisons are critical at the project-specific level, to determine whether there was any change in habitat use as a result of windfarm development, and at a regional level, supporting BOEM's cumulative effects analyses looking across projects. For this reason, BOEM will require that the time-series of species detections and the raw acoustic data are entered into publicly available data portals and archives.<br>The Lessee 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.<br>BOEM requires that archival, continuous recording systems be deployed at least 1 year prior to foundation pile driving, and their deployment must continue throughout construction and at least three but no more than 10 full calendar year of operations. The number of devices in each lease area must be sufficient to ensure that calling baleen whales could be detected, based on the assumption of a 5.4-nautical mile (10-kilometer) detection range for NARW calls. The sampling rate of the recorders should prioritize the detection of baleen whale vocalizations but must also have a minimum capability of detecting and storing acoustic data on noise from vessels, pile driving, and WTG operation.<br>Throughout deployments and data analysis, the lessee will be expected to follow the best practices outlined in the RWSC best practices document. The lessee must also process the data to document, at the very least, the presence of baleen | Marine Mammals | BOEM, BSEE, and NMFS |

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Additional Mitigation and Monitoring Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| | | | whale vocalizations and metrics of ambient noise. The lessee will be expected to archive the full acoustic record at National Centers for Ecological Information and to submit baleen whale detections to BOEM, BSEE, and NMFS at least twice a year. As an alternative to conducting PAM in its project area, the lessee may opt to make a financial contribution to BOEM's Environmental Studies Partnership for an Offshore Wind Energy Regional Observation Network (POWERON). The lessee's contribution would cover activities such as the purchase of instruments, annual deployments and refurbishment, data processing, and long-term data archiving. Funding from BOEM and other partners will contribute to POWERON, which will support PAM on non-lease areas and enable broader-scale analyses on cumulative effects to marine species. The lessee will be expected to cooperate with the POWERON team to facilitate deployment and refurbishment of instruments within the project area. If necessary, the lessee may request a temporary embargo on the public release of acoustic data that has been collected within the project area. | | |
| 8 | C, O&M, D | Reporting | The Lessee must report to BOEM and BSEE within 24 hours of confirmation any incidental take of an endangered or threatened species. | ESA-listed Marine Mammals, Sea Turtles, ESA-listed Fish | BOEM and BSEE |
| 9 | C, O&M, D | Brigantine Wilderness Area air quality related values (AQRV) Mitigation Framework | BOEM, BSEE, USFWS, and the Lessee would develop a framework for the mitigation of AQRV impacts at Brigantine Wilderness Area. The framework would include a description of existing conditions and monitoring objectives; description of preventative and compensatory mitigation measures; identification of the avoidance or offset value for each measure; cost estimates for each measure; schedule for USFWS implementation of each measure; the mechanism for the transfer of funding from the Lessee to USFWS; and reporting to demonstrate completion of implementation. | Air Quality | BOEM and BSEE |
| **NOAA/NMFS-Proposed Mitigation Measures** | | | | | |
| 1 | C | Artificial reef buffer for turbines | The Lessee must remove a single turbine approximately 150–200 feet (45.8–61 meters) from the observed Fish Haven (Atlantic City Artificial Reef Site). | Benthic, Finfish, Invertebrates, and Essential Fish Habitat, Commercial Fisheries and For-Hire Recreational Fishing | BOEM and NMFS |
| **NYSDOS-Proposed Mitigation Measures** | | | | | |
| 1 | C | Export cable spacing | When possible, the cable spacing should be minimized to reduce potential impacts on ocean users. | Multiple | N/A – best practice |
| 2 | Pre-C | Cable Maintenance Plan | In conjunction with cable monitoring, a Cable Maintenance Plan will be developed and implemented that requires prompt remedial burial of exposed and shallow-buried cable segments, review to address repeat exposures, and a process for identifying when cable burial depths reach unacceptable risk levels. | Multiple | N/A – best practice |
| 3 | Pre-C | Expand Fisheries Communications Plan | The Fisheries and Communication Plan will be expanded to include outreach and communication with all mariners, including the commercial shipping industry and recreational users. Communication and outreach should cover all project phases from pre-construction to decommissioning. | Navigation, Vessel Traffic | BOEM and BSEE |
| 4 | C, O&M, D | Incident reporting | Written notification of incidents (e.g., gear interactions, anchor strikes, vessel allisions, property damage less than $25,000) that fall below or are simply not captured by the regulatory thresholds outlined in 30 CFR 285.832 and 285.833 will be provided. Summaries could be provided to BOEM, BSEE, and USACE during construction and installation, operations, and decommissioning. | Multiple | N/A – best practice |
| **NJDEP-Proposed Mitigation Measure** | | | | | |
| 1 | Pre-C, C, O&M | Tree clearing restrictions | Because many wildlife species overwinter in cavities and nests, any mature trees slated for removal should be checked (including for vacant raptor nests) and avoided if possible. If the tree must be taken down, this should occur between October 1 and March 31. Mature trees are defined as live trees and/or snags ≥3 inches. | Bats, Birds, Coastal Habitat | USFWS and NJDEP |

**Table G-4. Lessee authorization and permit conditions[1]**

| # | Proposed Project Phase | Mitigation and Monitoring Measures | Description of Additional Agency-Required Mitigation and Monitoring Measures | Resource Area Mitigated | BOEM's Identification of the Anticipated Enforcing Agency |
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| **CZMA Federal Consistency Certification concurrence (April 2024)** | | | | | |
| 1 | C | Fishing gear-friendly cable protection measures | To minimize potential impacts on benthic resources, use mobile fishing gear-friendly cable protection measures to better reflect pre-existing conditions along seafloor cable routes consistent with N.J.A.C. 7:7-16.2, to the maximum extent practicable. This measure will also ensure that seafloor cable protection does not introduce new hangs for mobile fishing gear. | Benthic, Commercial Fisheries and For-Hire Recreational Fishing | NJDEP |
| 2 | C | Cable protection locations | To reduce the risk of adverse interactions with fishing gear or anchors, provide the maritime community with the physical locations of all cable protections installed during Project construction | Commercial Fisheries and For-Hire Recreational Fishing | NJDEP |
| 3 | C | MEC and/or UXO encounters | In the event that any military MEC or UXO are encountered during Project construction, immediately notify USCG of the presence of MEC/UXO and its location, consistent with N.J.A.C. 7:7-9.39, to avoid or minimize any special hazard that may be present. | Multiple | NJDEP |
| 4 | C; O&M | Scenic and Visual Resource Monitoring Plan | Prepare and implement a scenic and visual resource monitoring plan that monitors and compares the visual effects of the Project during construction and O&M phases (daytime and nighttime) to the finding in the Visual Impact Assessment (COP, Appendix II-M) and verifies the accuracy of the visual simulations. The plan will include documentation of meteorological influences on actual wind turbine visibility over a duration of time from selected key onshore observation points as determined by BOEM and Atlantic Shores. The plan will also include aircraft detection lighting system monitoring and documentation of effectiveness. | Scenic and Visual Resources | NJDEP |

[1] As of May 2024, authorizations from USEPA, NMFS, and USACE are pending.

## G.1 References Cited


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