Sunrise Wind - Appendix H: Mitigation and Monitoring

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APPENDIX H: MITIGATION AND MONITORING

This Final Environmental Impact Statement (EIS) assesses the potential biological, socioeconomic, physical, and cultural impacts that could result from the construction, operation and maintenance, and conceptual decommissioning of the Project proposed by Sunrise Wind LLC (Sunrise Wind) in its Construction and Operations Plan (COP). The Project described in the COP and this Final EIS would be approximately 1,034 megawatts (MW) in scale and approximately 16.4 nautical miles (nm; 18.9 miles, 30.4 km) south of Marth's Vineyard, Massachusetts, approximately 26.5 nm (30.5 miles, 48.1 km) east of Montauk, New York; and approximately 14.5 nm (16.7 miles, 26.8 km) from Block Island, Rhode Island within the area of Lease OCS-A 0487 (Lease Area). The Project is designed to serve the demand for renewable energy in New York.

As part of the Project, Sunrise Wind has committed to implementing Applicant Proposed Measures (APMs) to avoid, reduce, mitigate, or monitor impacts on the resources discussed in Chapter 3 of the Final EIS. These APMs are described in Table H-1 and assessed as part of the Proposed Action. BOEM considers only those measures that Sunrise Wind has committed to in the COP (Sunrise Wind 2023a) as APMs, including measures in Appendix O2, *Marine Mammal Protected Species Mitigation and Monitoring Plan (PSMMP),* Appendix O3, *Sea Turtle and ESA-listed Fish Species Mitigation and Monitoring Plan*, Appendix P2, *Post-construction Avian and Bat Monitoring Framework*, Appendix Z, *Cultural Resources Avoidance, Minimization, and Mitigation Measures,* Appendix AA1, *Fisheries and Benthic Monitoring Plan,* and Appendix AA2, *New York State Benthic Monitoring Plan*.

BOEM may select alternatives and require additional mitigation or monitoring measures to further protect and monitor these resources. These additional mitigation and monitoring measures are shown in Table H-2 and may result from reviews under several environmental statutes (i.e., Clean Air Act, Endangered Species Act, Magnuson-Stevens Act, Marine Mammal Protection Act, National Historic Preservation Act) as discussed in Appendix A of the Final EIS or other sources. Please note that not all these mitigation measures are within BOEM's statutory and regulatory authority, and some may be required by other governmental entities. Table H-3 provides descriptions of these measures as well as measures arising from BOEM's authorities. Other measures identified during development of this EIS are listed in Table H-3, and Table H-4 identifies measures that may be required by authorizations and permits issued to the Lessee.

If BOEM decides to approve the COP, the Record of Decision (ROD) will state which mitigation and monitoring measures identified by BOEM in Table H-2 and Table H-3 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 *Code of Federal Regulations* [*CFR]* 1505.3). Sunrise Wind would be required to certify compliance with these terms and conditions under 30 *CFR* 285.633(a). Furthermore, 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 in accordance with 30 *CFR* 585.634(b). If a mitigation measure was analyzed in the impacts analysis for the selected alternative and influenced the impact determination for a particular resource, that measure will be included as a term and condition.

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) modify 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 Sunrise Wind COP in accordance with 30 *CFR* 585.634(b), (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., a potential cumulative impact assessment tool). Unless specified as an APM, the proposed mitigation measures described below would not change the impact ratings on the affected resource, as described in Chapter 3 of the Final EIS, but would further reduce expected impacts or inform the development of additional mitigation measures, if required.

H.1. Applicant Proposed Measures

Table H-1. Applicant Proposed Measures

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
GEN-01	Onshore facilities are primarily sited within previously disturbed and developed areas (e.g., roadways, rights-of-way [ROWs], developed industrial/commercial areas) to the extent feasible.	Multiple	Measure incorporated into Project design
GEN-02	To the extent feasible, the Sunrise Wind Export Cable (SRWEC) and inter-array cables (IAC) will typically target a burial depth of 4 to 6 feet (ft; 1.2 to 1.8 meters [m]) in federal waters, with reasonable efforts to maximize burial depth within this range, depending on site-specific conditions, operating parameters of the installation equipment, and to protect location-specific hazards. The target burial depth will be determined based on an assessment of seabed conditions, seabed mobility, the risk of interaction with external hazards such as fishing gear and vessel anchors, and a site-specific Cable Burial Risk Assessment.	Multiple	United States Department of Interior Bureau of Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE)
GEN-03	Time-of-year restrictions for certain work activities (e.g., horizontal direct drilling (HDD) conduit stringing and tree removal) will be employed to the extent feasible. If work is anticipated to occur outside of these time-of-year restriction periods, Sunrise Wind will work with state and federal agencies to develop construction monitoring and impact minimization plans or mitigation plans, as appropriate.	Multiple	United States Fish and Wildlife Service (USFWS), New York State Public Service Commission (NYSPSC), and BOEM
GEN-04	The proposed temporary landing structure, and associated anchoring and spudding, will be positioned to avoid impacts to delineated submerged aquatic vegetation (SAV). Sunrise Wind will provide locations of identified SAV to contractors so they can avoid anchoring/spudding impacts to SAV.	Multiple	Measure incorporated into Project design

[1] BOEM and BSEE are in the process of transferring enforcement authorities from BOEM to BSEE.

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
GEN-05	To the extent feasible, installation of the IAC and SRWEC will be buried using equipment such as jet trenching, mechanical plow, jet plow and/or mechanical cutter. These equipment options would result in less habitat modification and impacts to surficial geology than dredging.	Multiple	Measure incorporated into Project design
GEN-06	A plan for vessels will be developed prior to construction to identify no-anchorage areas to avoid documented sensitive resources.	Multiple	BOEM and BSEE
GEN-07	Construction and operational lighting will be limited to the minimum necessary to ensure safety and compliance with applicable regulations. Limiting lighting to that which is required for safety and compliance with applicable regulations is expected to minimize impacts on essential fish habitat (EFH) and avian species.	Multiple	BOEM, BSEE, United States Coast Guard (USCG), and NYSPSC
GEN-08	Sunrise Wind will require operational automatic identification systems (AIS) on all vessels associated with the construction, operation and maintenance (O&M), and decommissioning of the Project, pursuant to USCG and AIS carriage requirements. AIS will be used to monitor the number of vessels and traffic patterns for analysis and compliance with vessel speed requirements.	Multiple	BOEM, BSEE, and USCG
GEN-09	Sunrise Wind is committed to an indicative layout scenario with wind turbine generators (WTGs) and the offshore converter station – direct current (OCS–DC) sited in a uniform east-west/north-south grid with 1.15 by 1.15-mi (1 by 1-nm; 1.85 by 1.85-km) spacing that aligns with other proposed adjacent offshore wind projects in the RI-MA Wind Energy Area (WEA) and MA WEA.	Multiple	Measure incorporated into Project design
GEN-10	The onshore transmission cable and onshore interconnection cable will not include any overhead utility poles, thus minimizing potential impacts to birds, bats, and adjacent properties associated with overhead lines.	Multiple	Measure incorporated into Project design
GEN-11	The WTGs and OCS–DC will be lit and marked in accordance with BOEM, USCG, and Federal Aviation Administration (FAA) requirements for aviation and navigation obstruction lighting, respectively.	Multiple	BOEM and USCG
GEN-12	The WTGs will be lit and marked in accordance with FAA Advisory Circular 70/7460-1L (2018), as recommended by BOEM's *Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development* (BOEM 2021).	Multiple	Measure incorporated into Project design

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
GEN-13	Sunrise Wind will use an aircraft detection lighting system (ADLS) or related means (e.g., dimming or shielding) to limit visual impact, pursuant to approval by the FAA and BOEM, commercial and technical feasibility at the time of Final Design Report (FDR) and Fabrication and Installation Report (FIR) approval, and dialogue with stakeholders.	Multiple	BOEM and BSEE
GEN-14	The construction of the Landfall and Intracoastal Waterway (ICW) HDD is expected to occur outside the summer tourist season, which is generally between Memorial Day and Labor Day. The construction schedule for the remaining onshore facilities will be designed to minimize impacts to the local communities to the extent feasible.	Multiple	Measure incorporated into Project design
GEN-15	Navigation lights, markings, sound signals, and other Aids to Navigation (including AIS on select WTGs) will be installed and maintained as prescribed within the Private Aids to Navigation Permit issued by the USCG for each WTG and the OSC-DC.	Multiple	USCG
GEN-16	Sunrise Wind will consult with the USCG, United States Navy, Naval Undersea Warfare Center, the Northeast Marine Pilots Association, and regional ferry service operators to avoid or reduce use conflicts.	Multiple	Measure incorporated into Project design
GEN-17	Sunrise Wind will use ADLS or related means (e.g., dimming or shielding) to limit visual impact, pursuant to approval by the FAA and BOEM, commercial and technical feasibility at the time of FDR/FIR approval, and dialogue with stakeholders.	Multiple	BOEM and BSEE
GEN-18	Dynamic positioning vessels will be used for installation of the IAC and SRWEC to the extent practicable. Dynamic positioning vessels minimize seafloor impacts, as compared to use of a vessel relying on multi anchors.	Multiple	BOEM and BSEE
GEN-19	Sunrise Wind will require all construction and O&M vessels to comply with applicable international (International Maritime Organization, International Convention for the Prevention of Pollution from Ships), federal (USCG), and state regulations and standards for treatment and disposal of solid and liquid wastes and the prevention and control of spills and discharges generated during all phases of the Project.	Multiple	BSEE

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
GEN-20	A Stormwater Pollution Prevention Plan (SWPPP), including erosion and sedimentation control best management practices (BMPs) and revegetation measures, will be implemented to minimize potential water quality impacts and limit sediment drift, transport, and deposition from construction and O&M of the onshore facilities.	Multiple	BSEE, USCG, United States Environmental Protection Agency (EPA), and NYSPSC
GEN-21	Accidental spill or release of oils or other hazardous materials will be managed offshore through an Emergency Response Plan/Oil Spill Response Plan (ERP/OSRP) and onshore through a Spill Prevention, Control, and Countermeasure Plan.	Multiple	BSEE, USCG, EPA, and NYSPSC
GEN-22	Where HDD is utilized, an Inadvertent Return Plan will be prepared and implemented to minimize the potential risks associated with the release of drilling fluids.	Multiple	BOEM and BSEE
GEN-23	A comprehensive Communication Plan will be implemented during offshore construction to inform all mariners, including commercial and recreational boaters, of construction activities and Project-related vessel movements. Communication will be facilitated through a Project website, public notices to mariners and vessel float plans, and a fisheries liaison. Sunrise Wind will submit information to the USCG to issue Local Notice to Mariners during offshore installation activities.	Multiple	Measure incorporated into Project design
GEN-24	Sunrise Wind will coordinate with local authorities and develop a Maintenance and Protection of Traffic (MPT) Plan as part of the Project's Environmental Management and Construction Plan (EM&CP) to minimize potential traffic impacts during construction.	Multiple	New York State Department of Transportation (NYSDOT) and/or local authorities
GEN-25	No permanent exclusion zones during operation of the Sunrise Wind Farm (SRWF), so both Project and non-Project vessels will be free to navigate within, or close to, the SRWF.	Multiple	BOEM, BSEE and USCG
GEN-26	An Invasive Species Management Plan will be implemented to manage the spread of invasive plant species.	Multiple	BOEM and BSEE
GEN-27	The onshore transmission cable will be installed via HDD under the ICW.	Multiple	Measure incorporated into Project design

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
GEO-01	Avoid identified shallow hazards, to the extent feasible.	Multiple	Best practice – not an enforceable measure
GEO-02	The onshore transmission cable will be installed via HDD under the ICW. HDD and trenchless methods will be used elsewhere onshore, where appropriate, to minimize impacts to surface locations and resource areas.	Geological resources	Measure incorporated into Project design
GEO-03	Use of monopile and piled jacket foundations with associated scour protection will minimize impacts to surficial geology, compared to other foundation types.	Geological resources	Measure incorporated into Project design
GEO-04	Dynamic positioning vessels will be used for installation of the IAC and SRWEC to the extent practicable. Use of dynamic positioning vessels will minimize impacts to the seabed, compared to the use of a vessel relying on multiple anchors. The SRWEC Landfall will be installed via HDD to avoid impacts to nearshore zones and surficial geologic resources. The onshore transmission cable will also be installed via HDD under the ICW to avoid impacts to coastal resources; HDD and the trenchless methods will also be used elsewhere onshore, where appropriate, to minimize impacts to surface locations and resource areas.	Geological resources	Measure incorporated into Project design
WQ-01	Onshore construction activities will be conducted in compliance with the New York State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges associated with construction activities, and an approved SWPPP.	Water quality	NYSPSC
WQ-02	Sunrise Wind will develop a Suspended Sediment and Water Quality Monitoring Plan.	Water quality	NYSPSC
AQ-01	Diesel generators on WTGs and the OCS–DC will only burn low-sulfur diesel in the engines. Diesel generators on WTGs will only be used temporarily during commissioning or in an emergency power outage.	Air quality	Measure incorporated into Project design
AQ-02	Vessels meeting the definition of an OCS source and providing construction or maintenance services for the SRWF and SRWEC will use low-sulfur fuel, marine distillate, or marine residual fuels when operating any diesel-fired emission unit, as specified by applicable regulations or OCS Permit conditions.	Air quality	OCS Permit conditions

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
AQ-03	Vessel engines will meet the applicable EPA air emission standards, specified in the OCS Permit, to satisfy Best Available Control Technology or Lowest Achievable Emission Rate.	Air quality	EPA, BOEM, BSEE
AQ-04	Onshore facilities, equipment, and fuel suppliers will provide equipment and fuels that comply with the applicable EPA or equivalent emission standards.	Air quality	EPA
AQ-05	Potential fugitive emissions of particulate matter from onshore construction activities will be minimized by implementing dust control measures.	Air quality	NYSPSC
AQ-06	Sunrise Wind will obtain emission reduction credits to offset emissions from construction and O&M activities, if required, as a condition of the OCS Permit.	Air quality	OCS Permit Conditions
AQ-07	Gas-insulated switchgears are manufactured to be completely sealed and would likely result in little or no Sulfur hexafluoride (SF6) emissions. Switchgears containing SF6 on the OCS–DC and OnCS–DC will be equipped with integral low-pressure detectors to detect SF6 gas leakages, should they occur.	Air quality	EPA
CHF-01	Where appropriate, temporary erosion controls such as swales and erosion control socks will be installed and will be maintained until the site is restored and stabilized.	Coastal habitat and fauna	Measure incorporated into Project design
CHF-02	The SRWEC Landfall will be installed via HDD to avoid impacts to the nearshore zones and coastal resources.	Coastal habitat and fauna	Measure incorporated into Project design
BIRD-01	Sunrise Wind will take measures to reduce perching opportunities at operating turbines.	Birds	USFWS and NYSPSC
BIRD-02	WTG layout in uniform east-west/north-south layout. Wide spacing may minimize risk of collision.	Birds	Measure incorporated into Project design
BIRD-03	WTGs will have air gaps from mean sea level to minimum blade swept height of at least 131.2 ft (40 m) which minimizes collision risk to marine birds.	Birds	Not an enforceable measure

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
BIRD-04	Sunrise Wind developed a Post-construction Avian and Bat Monitoring Framework for the Project that summarizes the approach to monitoring, describes overarching monitoring goals and objectives; identifies the key avian and bat species, prioritizes questions, and data gaps unique to the region and Project Area that will be addressed through monitoring; and describes methods and time frames for data collection, analysis, and reporting. Post-construction monitoring will assess the impacts of the Project with the purpose of filing select information gaps and supporting validation of the Sunrise Wind Avian Risk Assessment. Focus may be placed on improving knowledge of Endangered Species Act (ESA)-listed species occurrence and movements offshore, avian collision risk, species/species group displacement, or similar topics. Where practicable, monitoring conducted by Sunrise Wind will build on and align with post-construction monitoring conducted by the other Ørsted/Eversource offshore wind projects in the northeast region. Sunrise Wind will engage with federal and state agencies and environmental nongovernmental organizations (eNGOs) to identify appropriate monitoring options and technologies and to facilitate acceptance of the final plan.	Birds	BOEM, USFWS, NYSPSC, and NPS
BAT-01	Sunrise Wind will document any dead (or injured) bats found incidentally on vessels and structures during construction, O&M, and decommissioning and provide an annual report to BOEM and USFWS.	Bats	USFWS, BOEM, NYSPSC, BSEE, and National Parks Service (NPS)
BAT-02	Onshore facilities will not be sited within, and no tree clearing activities will occur within, 150 ft (45.7 m) of any known northern long-eared bat maternity roost or within 0.25 mile (mi; 0.4 kilometer [km]) of any known northern long-eared bat hibernaculum.	Bats	USFWS, NYSPSC
BAT-03	Sunrise conducted an acoustic bat survey at all areas requiring tree clearing for the Project following the USFWS *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines* (2022) on August 9-12, 2022. The survey protocol and effort in 2022 remain consistent with the updated USFWS guidelines released in March 2023. No northern long-eared bats were detected during the acoustic surveys; therefore, impacts to northern long-eared bats are not anticipated.	Bats	USFWS, NYSPSC

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
BAT-04	Sunrise Wind will restrict all tree clearing between December 1 and February 28 of any given year to the extent feasible to avoid impacts to northern long-eared bats during construction of the Onshore Facilities. If work is anticipated to occur outside of this period, Sunrise Wind will implement the Project's Northern Long-eared Bat Avoidance and Minimization Plan, which was approved on June 22, 2023, by the NYSPSC and if applicable, will consult with USFWS.	Bats	USFWS, NYSPSC
BAT-05	If at any time during the life of the Project any northern long-eared bat maternity roost trees are discovered, New York State Department of Environmental Conservation (NYSDEC) will be notified within 24 hours of discovery, and an area of at least 500 ft (152 m) in radius around the roost tree(s) shall be marked and avoided until notice to continue construction, ground clearing, grading, maintenance or restoration activities, as applicable, at that site is granted by NYSPSC after consultation with NYSDEC, except if necessary for the protection of human life and property.	Bats	NYSPSC
BAT-06	Except as otherwise specified, if it is determined to be necessary to take occupied habitat or individuals of northern long-eared bat. Sunrise Wind will develop a Net Conservation Benefit Plan in consultation with and accepted by NYSDEC and New York State Department of Public Service (NYSDPS) staff that satisfies the requirements of 6 *New York Codes, Rules, and Regulations (NYCRR)* 182.	Bats	USFWS, NYSPSC
BENTH-01	The SRWF and SRWEC will be sited to avoid and minimize impacts to sensitive habitats (e.g., hard bottom habitats) to the extent practicable.	Benthic and shellfish resources	Not an enforceable measure
FISH-01	Sunrise Wind will coordinate with NYSDEC, National Marine Fisheries Service (NMFS) and United States Army Corps of Engineers (USACE) regarding time of year restrictions for summer flounder habitat areas of particular concern.	Finfish and EFH	USACE
FISH-02	Sunrise Wind will employ time-of-year in-water restrictions to the extent feasible to avoid or minimize impacts to Atlantic sturgeon. If work is anticipated to occur outside of these time-of-year restriction periods, Sunrise Wind will work with state and federal agencies to develop construction monitoring and impact minimization plans or mitigation plans as appropriate.	Finfish and EFH	USFWS, NMFS
FISH-03	Sunrise Wind is committed to collaborative science with the commercial and recreational fishing industries prior to and following construction. Fisheries and benthic monitoring studies (Appendices AA1 [Sunrise Wind 2022a] and AA2 [Sunrise Wind 2022d] of the Construction and	Finfish, EFH, commercial fisheries	Measure incorporated into Project design

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	Operations Plan [COP]) are being planned to assess impacts associated with the Project on economically and ecologically important fisheries resources within the SRWF, along the SRWEC, and in the ICW. These studies will be conducted in collaboration with the local fishing industry and will build upon monitoring efforts being conducted by affiliates of Sunrise Wind at other wind farms in the region.	and for-hire recreational fisheries	
FISH-04	Sunrise Wind aims, where feasible, to mitigate and reduce potential impacts to fishing activities, as outlined in the Fisheries Communication Plan and Outreach Plan, and the Fisheries Mitigation Plan for Sunrise Wind, which is available on the New York State Energy Research and Development Authority (NYSERDA) website and will be updated throughout Project development. Fisheries Communication Plan: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/SRW01_COP_AppB_Fisheries%20Communication%20Plan_2021-10-28_508.pdf Fisheries Mitigation Plan: https://www.nyftwg.com/wp-content/uploads/2021/08/FMP_Sunrise-Wind_Version-2.1_20210820_Clean.pdf	Finfish, EFH, commercial fisheries and for-hire recreational fisheries	Measure incorporated into Project design
FISH-05	Construction and operational lighting will be limited to the minimum necessary to ensure safety and compliance with applicable regulations. Limiting lighting to that which is required for safety and compliance with applicable regulations is expected to minimize impacts on EFH.	Finfish and EFH	Measure incorporated into Project design
MMST-01	Sunrise Wind will comply with the current National Oceanic and Atmospheric Administration (NOAA) Fisheries speed restrictions at the time of Project activities.	Marine mammals, sea turtles	BOEM, BSEE, EPA, and NMFS
MMST-02	Sunrise Wind will adhere to vessel strike avoidance measures as required by BOEM and NOAA Fisheries.	Marine mammals, sea turtles	BOEM, BSEE, EPA, and NMFS
MMST-03	For all munitions and explosives of concern/unexploded ordnance (MEC/UXO) clearance methods, safety measures such as the use of guard vessels, enforcement of safety zones, and others will be identified in consultation with a MEC/UXO specialist and the appropriate agencies and implemented as appropriate. Residual risk management actions will be implemented, including developing an Emergency Response Plan, conducting MEC/UXO safety briefings, and retaining an on-call MEC/UXO consultant.	Marine mammals, sea turtles	BOEM, BSEE, EPA, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
MMST-04	An MEC/UXO Risk Assessment with Risk Mitigation Strategy was developed to evaluate and reduce risks associated with MEC/UXO activities, and underwater acoustic modeling of UXO detonations was conducted to evaluate potential impacts from underwater noise.	Marine mammals, sea turtles	BOEM, BSEE, EPA, NMFS, and USACE
MMST-05	Develop and implement a Protected Species Mitigation and Monitoring Plan (PSMMP) and implement the relevant mitigation measures included, pursuant to ongoing dialogue with BOEM and NOAA Fisheries.	Marine mammals, sea turtles	BOEM, BSEE, EPA, NMFS, and USACE
MMST-06	Plow cables/umbilicals will be under constant tension, and in this taut condition, are not expected to represent an entanglement risk.	Marine mammals, sea turtles	Measure incorporated into Project design
MMST-07	Sunrise Wind will provide training for personnel onboard Project vessels, including Protected Species Observer (PSO) monitoring and reporting procedures, to emphasize individual responsibility for marine mammal and sea turtle awareness and protection.	Marine mammals, sea turtles	BOEM, BSEE, EPA, NMFS, and USACE
MMST-08	All crew supporting the Project will undergo marine debris awareness training, and such training will include use of the data and educational resources available through the NOAA Fisheries Marine Debris Program.	Marine mammals, sea turtles	BOEM, BSEE, EPA, NMFS, and USACE
MMST-09	Sunrise Wind will advise all construction and O&M vessels to comply with USCG and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials.	Marine mammals, sea turtles	USCG, EPA
MMST-10	Sunrise Wind will continue to support external initiatives to further mitigate marine traffic impacts and currently is a supporter of the Whale Alert System.	Marine mammals	Measure incorporated into Project design
MMST-11	Sunrise Wind participated in a developer co-funded initiative to support continuation of New England Aquarium Right Whale Aerial Surveys in 2020/21.	Marine mammals	Measure incorporated into Project design
MMST-12	Sunrise Wind completed a comprehensive underwater acoustic assessment to include modeling in support of evaluation of potential impacts due to noise generated during construction of the Project. The assessment followed NOAA Fisheries' 2018 revised *Technical Guidance for Assessing*	Marine mammals	BOEM, NMFS, BSEE

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	the Effects of Anthropogenic Sound on Marine Mammal Hearing (NOAA Fisheries 2018). Potential zones of influence described in this assessment are reflected in the proposed mitigation measures in the Mitigation and Monitoring Plan.		
MMST-13	A Sea Turtle and ESA-listed Fish PSMMP incorporates findings from the Underwater Acoustic Assessment; supplements existing data gaps; allows for an evaluation of changes caused by offshore infrastructure within the context of larger regional shifts in species distributions; and describes the avoidance, minimization, mitigation, and monitoring measures and approaches taken by Sunrise Wind.	Sea turtles	BOEM, BSEE, EPA, NMFS, and USACE
CUL-01	A Monitoring Plan and Post Review Discoveries Plan will be implemented that will include stop-work and notification procedures to be followed if a cultural resource is encountered during installation.	Cultural resources	BOEM, BSEE, NPS, NYSPSC and USACE
CUL-02	The SRWF and SRWEC will be sited to avoid impacts to potential marine archaeological resources (MARs), including shipwrecks and paleo landforms, to the extent practicable, with continued oversight by a Qualified Marine Archaeologist.	Cultural resources	Measure incorporated into Project design
CUL-03	A Cultural Resources Avoidance, Minimization, and Monitoring Plan was developed to address anticipated impacts to historic properties, inclusive of MARs. The mitigation plan also incorporates the results of the Marine Archaeological Resources Assessment and present property-specific measures for all MARs subject to potentially unavoidable adverse effects (per 36 *CFR* 800.5).	Cultural resources	BOEM, BSEE, NPS, and USACE
CUL-04	The Project has been designed to minimize visual impacts to historic and cultural properties to the extent feasible. The Project's layout was adjusted to align turbines at the eastern portion of the Lease Area, so that closest turbines are at least 15 mi (24.1 km) from shore. Visibility of the turbine array from all identified properties within the Preliminary Area of Potential Effects would be minimized and mitigated further by measures adopted in this table including ADLS and markings (GEN-07), and as in COP Appendix Z (Sunrise Wind 2023b).	Cultural resources	Measure incorporated into Project design
CUL-05	Avoidance areas surrounding identified MARs will reduce the chances of accidental disturbance. The size of these areas will be determined individually based on characterization of the site and delineation of the site's horizontal and vertical boundaries.	Cultural resources	Measure incorporated into Project design

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
CUL-06	Mitigation in the form of documentation, planning, or educational materials will be coordinated with stakeholders, as in COP Appendix Z (Sunrise Wind 2023b).	Cultural resources	BOEM, BSEE, EPA, USACE, NPS
REC-01	Sunrise Wind has developed a construction schedule to minimize activities in the onshore export cable route during the peak summer recreation and tourism season, where practicable, and will develop a Communication Plan with adjacent land managing agencies to communicate this schedule with the public and provide messaging via various platforms and on-site in adjacent lands. The Communication Plan would be used to help inform the public of what to expect when planning recreation visits in areas adjacent to construction activities.	Recreation and tourism	NYSPSC, NPS, Suffolk County, local municipalities
REC-02	Unless otherwise necessary for safety purposes where disruptions would be short-term and infrequent, lasting minutes; Sunrise Wind shall maintain continual pedestrian and vehicular use of and access to park amenities within Smith Point County Park on Fire Island, Smith Point County Marina, Southaven County Park in the Town of Brookhaven, and other existing public access areas.	Recreation and tourism	NYSPSC, NPS, Suffolk County, and local municipalities
CFHFISH-01	Sunrise Wind aims, where feasible, to mitigate and reduce potential impacts to fishing activities, as outlined in the Fisheries Communication and Outreach Plan, and the Fisheries Mitigation Plan for Sunrise Wind, which is available on the NYSERDA website and will be updated throughout the course of the Project. Fisheries Communication Plan: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/SRW01_COP_AppB_Fisheries%20Communication%20Plan_2021-10-28_508.pdf Fisheries Mitigation Plan: https://www.nyftwg.com/wp-content/uploads/2021/08/FMP_Sunrise-Wind_Version-2.1_20210820_Clean.pdf	Commercial fisheries and for-hire recreational fishing	Measure incorporated into Project design
CFHFISH-02	Sunrise Wind has developed and implemented a Fisheries Communication and Outreach Plan (COP Appendix B, Ørsted Offshore North America 2021). The plan includes the appointment of a dedicated fisheries liaison as well as fisheries representatives who will serve as conduits for providing information to, and gathering feedback from, the fishing industry, as well as Project-specific details on fisheries engagements.	Commercial fisheries and for-hire recreational fishing	Measure incorporated into Project design

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
CFHFISH-03	The locations of the SRWF, SRWEC, and IAC and associated cable protections will be provided to NOAA's Office of Coast Survey after installation is completed so that they may be marked on nautical charts.	Commercial fisheries and for-hire recreational fishing	NOAA
CFHFISH-04	Project construction, O&M, and decommissioning activities will be coordinated with appropriate contacts at USCG and Department of Defense (DOD) command headquarters.	Commercial fisheries and for-hire recreational fishing	USCG, DOD
CFHFISH-05	Ørsted administers a portfolio-wide Ørsted U.S. Offshore Wind Fisheries Gear Loss Prevention and Claim Procedure, which is currently in use and will exist for the life of the Project.	Commercial fisheries and for-hire recreational fishing	Measure incorporated into Project design
CFHFISH-06	Sunrise Wind will establish a Direct Compensation Program, Coastal Community Fund, and Navigation Safety Fund to address impacts to commercial fishing operations and for-hire recreational fishing operations in Rhode Island and Massachusetts. Understanding there may be impacts outside of Rhode Island and Massachusetts, Sunrise Wind is also committed to advancing and adhering to principles set forth by the 11-State Compensatory Mitigation Initiative as well as ideals laid out by BOEM's *Draft Guidelines for Mitigating Impacts to Commercial and Recreation Fisheries on the Outer Continental Shelf Pursuant to 30 CFR § 585* (2022). Final agreed measures have been, or will be, incorporated within each of Rhode Island, Massachusetts, and New York's Coastal Consistency Determinations, which are anticipated to be completed in Q4 2023.	Commercial fisheries and for-hire recreational fishing	Measure incorporated into Project design
CFHFISH-07	Sunrise Wind will establish a New York State Fisheries Compensation Plan in accordance with Condition 60 of the Article VII Certificate of Environmental Compatibility and Public Need.	Commercial fisheries and for-hire recreational fishing	Measure incorporated into Project design
LU-01	Sunrise Wind will develop crossing and proximity agreements with utility owners prior to utility crossings. Crossing agreements in U.S. waters are supported by the International Cable Protection Committee, which provides a framework for establishing cable crossing agreements.	Land use and coastal infrastructure	Measure incorporated into Project design
LU-02	To allow for traffic to move safely, traffic control measures, such as signage and traffic flaggers, will be used wherever necessary. Traffic control measures to address traffic flow in and around construction areas will be developed as part of the MPT Plan. Proper traffic control measures will be utilized to ensure the movement of traffic and to mitigate impacts on bus route	Land use and coastal infrastructure	NYSDOT, Suffolk County, local municipalities

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	schedules. Access to bus stops will also be maintained or temporarily relocated during construction, thereby minimizing impacts to bus stops and bus stop access.		
LU-03	All construction-related impacts to roadways and parking lots will be restored to pre-construction conditions in accordance with NYSDOT *Standard Specifications for Construction and Materials* and in coordination with local entities. Locations used for HDD work areas and temporary laydown yards will be restored to pre-existing conditions in accordance with landowner requests and permit requirements.	Land use and coastal infrastructure	NYSPSC
NAV-01	Sunrise Wind will have a Lighting and Marking Plan that complies with USCG navigation lights requirement and FAA aviation light requirements.	Navigation	BOEM, BSEE, and USCG
NAV-02	Sunrise Wind will request USCG to establish safety zones for construction of WTGs and offshore substations. Marine construction activities include other activities such as cable installation, etc., which USCG does not intend to do.	Navigation	Measure incorporated into Project design
NAV-03	To reduce the likelihood of an allision or collision during construction, Project safety vessel(s) will be on scene to advise mariners of construction activities.	Navigation	Measure incorporated into Project design
NAV-04	Mariner radio-activated sound signals are very high frequency (VHF)-based and are expected to be deployed in the SRWF, similar to the deployment at Block Island Wind Farm.	Navigation	BOEM, BSEE, and USCG
NAV-05	Vessel operators are expected to follow the International Regulations for Preventing Collisions at Sea 1972 (COLREGs) Rule 5 that states "at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and risk of collision."	Navigation	BOEM, BSEE, and USCG
NAV-06	The WTGs and OCS–DC will have a marked air gap to aid in the avoidance of an allision incident.	Navigation	BOEM, BSEE, and USCG
NAV-07	A Project construction guideline will define a window related to wind, sea state, and other constraints under which construction activities will start/continue or will stop/be discontinued. Conditions and forecasts will be monitored to enable proactive planning and early warning of future unsafe conditions. A 24-hr operational monitoring center is planned to verify safe	Navigation	Measure incorporated into Project design

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	conditions are being maintained and will have the ability to remotely operate and shut down WTGs if required.		
NAV-08	During construction and O&M, notices to mariners will be published on, and broadcasted through, regular radio communications, online information will be available for mariners, and notices to mariners from the USCG will occur.	Navigation	Measure incorporated into Project design
NAV-09	Frequent updates on offshore activities to fishing operators will be provided via online updates, twice-daily updates on VHF channels, and through fisheries liaisons and local fisheries representatives based in regional ports.	Navigation	Measure incorporated into Project design
NAV-10	Information on the exact locations of newly installed Project components, including structures, cable, and cable protection, will be provided to NOAA to include on navigation charts to reduce any potential impact to marine navigation.	Navigation	Measure incorporated into Project design
NAV-11	To minimize impacts to local traffic, several trenchless crossings are planned along the route for the onshore transmission cable, including at the Long Island Rail Road (LIRR), Sunrise Highway, Long Island Expressway, and Carmans River.	Navigation	Measure incorporated into Project design
OUSE-01	Sunrise Wind has implemented or will implement, a number of measures to minimize adverse effects on existing cables, such as dropping 4 WTG positions; minimizing the number of IAC and SRWEC crossings, and crossing perpendicular where feasible; designing the Landfall HDD to avoid existing cables; coordinating with telecommunications cable owners to develop cable protection design, crossing, and proximity agreements; and following International Cable Protection Committee recommendations during construction and O&M.	Other Uses	Measure incorporated into Project design
SOC-01	Where feasible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.	Socioeconomic resources, environmental justice	Measure incorporated into Project design
VIS-01	WTGs will have uniform design, height, and rotor diameter.	Scenic and visual resources	BOEM and BSEE
VIS-02	Screening will be implemented at the OnCS–DC to the extent feasible, to reduce potential visibility and noise.	Scenic and visual resources	NYSPSC and local municipalities

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Applicant Proposed Measures in the Marine Mammal Protection Act Letter of Authorization Application and Protected Species Mitigation and Monitoring Plan Draft, Dated May 10, 2022 (Sunrise Wind 2022b)			
PSO/Passive acoustic monitoring (PAM) training and requirements	PSOs may be third-party observers (i.e., NMFS-approved PSOs) or crew members. All PSOs and PAM operators will have completed a NMFS-approved PSO training course. The PSO field team and the PAM team will have a lead observer (lead PSO and PAM lead) who will have experience in the northwestern Atlantic Ocean. Additionally, the PAM lead will have experience with the call types of mysticetes needing to be mitigated/monitored. Remaining PSOs and PAM operators will complete a Permits and Environmental Compliance Plan training and a 2-day training / refresher session with the PSO provider and Project compliance representatives before the anticipated start of Project activities. Any PSO or PAM operator on duty will have authority to delay the start of operations or to call for a shutdown based on their visual observations or acoustic detections. No individual PSO will work more than 4 consecutive hours without a 2-hour break between watches, or longer than 12 hours during a 24-hour period. Each PSO will be provided one 8-hour break per 24-hour period to sleep. 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). 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 handheld spotlight, and/or a mounted thermal camera system. Activities with larger monitoring zones (greater than 2 km [1.2 mi]) will use 25 x 150 mm "big eye" binoculars. 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. Vessel personnel communication to the PSO team will be dependent on the vessel. However, means of communication may include phone, handheld radio, or face-to-face verbal communication. Members of the monitoring team will consult with NMFS' North Atlantic Right Whale (NARW) Reporting System for the presence of NARWs in the Project Area. Deployment of the PAM system will be outside the perimeter of the shutdown zone. Four-hour PAM operator rotations for 24-hour operation vessels will be implemented.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Vessel strike avoidance policy – general measures	• The Project will implement a vessel strike avoidance policy for all vessels under contract to Ørsted to reduce the risk of vessel strikes, and the potential of death and/or serious injury to marine mammals that may result from collisions with vessels. In addition, Sunrise Wind will implement a Standard Plan and/or an Adaptive Plan, which will include additional measures when traveling within established NARW dynamic management areas (DMAs). The three plans are intended to be interchangeable and implemented throughout both the construction and operation phases of the Project. • Vessel operators and crews shall receive protected species identification training. This training will cover sightings of marine mammals and other protected species known to occur or which have the potential to occur in the Project Area. It will include training on making observations in both good weather conditions (i.e., clear visibility, low wind, low sea state) and bad weather conditions (i.e., fog, high winds, high sea states, in glare). Training will include not only identification skills but information and resources available regarding applicable federal laws and regulations for protected species. It will also cover any critical habitat requirements, migratory routes, seasonal variations, behavior identification, etc. • All personnel working offshore will receive training on marine mammal awareness and vessel strike avoidance measures. • Vessel operators and crews will maintain a vigilant watch for marine mammals and other protected species and change course or respond with the appropriate action (e.g., slow down) to avoid striking marine mammals. • All attempts shall be made to remain parallel to the animal's course when a traveling marine mammal is sighted in proximity to the vessel in transit. All attempts shall be made to reduce any abrupt changes in vessel direction until the marine mammal has moved beyond its associated separation distance (as described above). • If an animal or group of animals is sighted in the vessel's path or in proximity to it, or if the animals are behaving in an unpredictable manner, all attempts shall be made to divert away from the animals or, if unable due to restricted movements, reduce speed and shift gears into neutral until the animal(s) has moved beyond the associated separation distance (except for voluntary bow riding dolphin species).	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]

	• All vessels will comply with NMFS regulations and speed restrictions and state regulations as applicable for NARW (see vessel speed restriction Standard Plan and Adaptive Plan outlines below). Vessel operators will monitor the Project's Situational Awareness System and as necessary, Whale Alert and the NARW Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs once every 4-hour shift during Project-related activities.
	• All vessels will comply with the approved adaptive speed plan which will include additional measures including travel within established NARW Slow Zones.
	• Sunrise Wind will submit a final NARW Vessel Strike Avoidance Plan at least 90 days prior to commencement of vessel use that details the Adaptive Plan and specific monitoring equipment to be used. The plan will, at 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.
	• The vessel will remain parallel to the animal's course when a traveling marine mammal is sighted in proximity to the vessel in transit. The vessel will reduce any abrupt changes in vessel direction until the marine mammal has moved beyond its associated separation distance.
	• Sunrise Wind will establish a situational awareness network for marine mammal detections through the integration of sighting communication tools such as Mysticetus, Whale Alert, Whale Map, etc. Sighting information will be made available to all Project vessels through the established network. Sunrise Wind's Marine Coordination Center will serve to coordinate and maintain a Common Operating Picture. In addition, systems within the Marine Coordination Center, along with field personnel, will:
	  ○ monitor the NMFS NARW reporting systems daily;
	  ○ monitor the USCG VHF Channel 16 throughout the day to receive notifications of any sightings; and
	  ○ monitor any existing real-time acoustic networks.		

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Vessel separation distances	• Vessels will maintain, to the extent practicable, separation distances of: ○ greater than 500 m (1,640 ft) distance from any sighted NARW or unidentified large marine mammals; ○ greater than 100 m (328 ft) from all other large whales; ○ greater than 50 m (164 ft) for dolphins, porpoises, seals, and sea turtles.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Vessel speed restrictions – base conditions	• All vessels will comply with NMFS regulations and speed restrictions and state regulations as applicable for NARW. • All vessels 65 ft (20 m) or longer subject to the jurisdiction of the U.S. will comply with the 10-knot speed restriction when entering or departing a port or place subject to U.S. jurisdiction, and in any seasonal management area (SMA) during NARW migratory and calving periods from November 1 to April 30. • The same speed restriction will apply to vessels traveling within important feeding areas including Cape Cod Bay from January 1 – May 15, off of Race Point from March 1 – April 30, and in the Great South Channel from April 1 – July 31. • Situational Awareness/Common Operating Pictures: Sunrise Wind will establish a situational awareness network for marine mammal detections through the integration of sighting communication tools such as Mysticetus, Whale Alert, WhaleMap, etc. Sighting information will be made available to all Project vessels through the established network. Sunrise Wind's Marine Coordination Center will serve to coordinate and maintain a Common Operating Picture. In addition, systems within the Marine Coordination Center, along with field personnel, will: ○ monitor the NMFS NARW reporting systems daily; ○ monitor the USCG VHF Channel 16 throughout the day to receive notifications of any sighting; and ○ monitor any existing real-time acoustic networks. • All vessels will comply with the approved adaptive speed plan which will include additional measures including travel within established NARW Slow Zones.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Vessel speed restrictions – Standard Plan	Under the Standard Plan, Sunrise Wind will implement base conditions as described above. • **Between November 1 and April 30:** Vessels of all sizes will operate port to port (from ports in NJ, NY, MD, DE, and VA) at 10 knots or less between November 1 and April 30 except for vessels while transiting in Narragansett Bay or Long Island Sound which have not been demonstrated by best available science to provide consistent habitat for NARWs. Vessels transiting from other ports outside those described will operate at 10 knots or less when within any active SMA or within the Wind Development Area (WDA) including the SRWF and SRWEC. • **Year Round**: Vessels of all sizes will operate at 10 knots or less in any DMAs. • **Between May 1 and October 31:** All underway vessels (transiting or surveying) operating at greater than 10 knots 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° direction of the forward path of the vessel (90° port to 90° starboard). Visual observers must be equipped with alternative monitoring technology for periods of low visibility (e.g., darkness, rain, fog). 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. • A complete vessel speed plan for sea turtles and ESA-listed fish will be included in the PSMMP.	Marine mammals, sea turtles, ESA-listed fish	BOEM, BSEE, and NMFS
Vessel speed restrictions – Adaptive Plan	The Standard Plan outlined above will be adhered to 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 Sunrise Wind choose not to implement this Adaptive Plan, or a component of the Adaptive Plan is offline (e.g., equipment technical issues), Sunrise Wind will default to the Standard Plan.	Marine mammals, sea turtles, ESA-listed fish	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	The Adaptive Plan will not apply to vessels subject to speed reductions in SMAs as designated by NOAA's Vessel Strike Reduction Rule. • **Year Round:** A semi-permanent acoustic network comprising near real-time bottom mounted and/or mobile acoustic monitoring platforms will be installed such that confirmed NARW detections are regularly transmitted to a central information portal and disseminated through the situational awareness network. • The transit corridor and WDA will be divided into detection action zones. • Localized detections of NARWs in an action zone would trigger a slow-down to 10 knots or less in the respective zone for the following 24 hours. Each subsequent detection would trigger a 24-hour reset. A zone slow-down expires when there has been no further visual or acoustic detection in the past 24 hours within the triggered zone. The detection action zones 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. • **Year Round**: All underway vessels (transiting or surveying) operating greater than 10 knots 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° direction of the forward path of the vessel (90° port to 90° starboard). Visual observers must be equipped with alternative monitoring technology for periods of low visibility (e.g., darkness, rain, fog). 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. • **Year Round:** 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 or less. Any active action zones within the DMA may trigger a slow down as described above. • If PAM and/or automated visual systems are offline, the Standard Plan measures will apply for the respective zone (where PAM is offline) or vessel (if automated visual systems are offline).		

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
PSO/PAM data recording	• All sightings of marine mammals visually observed or acoustically detected will be recorded. • All data will be recorded using industry-standard software. • Data recorded will include information related to ongoing operations, observation methods and effort, visibility conditions, marine mammal detections, and any mitigation actions requested and enacted.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Reporting	• If a stranded, entangled, injured, or dead protected species is observed, the sighting will be reported within 24 hours to NMFS RWSAS hotline. • In the event a protected species is injured or killed as a result of Project activities, the vessel captain or PSO on board shall report immediately to NMFS Office of Protected Resources (OPR) who is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance. Additionally, the vessel captain or PSO on board shall report immediately to NMFS OPR and Greater Atlantic Regional Fisheries Office no later than within 24 hours, and NOAA Fisheries Marine Mammal and Sea Turtle Stranding and Entanglement Hotline or alternative electronic reporting systems as approved by the NOAA stranding program, as well as the USCG. • Any injured or dead ESA or marine mammal species (reporting requiring immediate response) must be reported to BSEE at protectedspecies@bsee.gov. • Any NARW sightings will be reported as soon as feasible and no later than within 24 hours to the NMFS RWSAS hotline or via the WhaleAlert Application. Data and final reports will be prepared using the following protocols: • A quality assured/quality controlled (QA/QC'd) database of all sightings and associated details (e.g., distance from vessel, behavior, species, group size/composition) within and outside of the designated shutdown zones, monitoring effort, environmental conditions, and Project-related activity will be provided after field operations and reporting are complete; • Weekly PSO/PAM reports (during construction activity) will be submitted every Wednesday following a Sunday-Saturday week; • Final reports will follow a standardized format for PSO reporting from activities requiring marine mammal mitigation and monitoring; and	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• An annual visual and acoustic monitoring report will be provided to NMFS and to BOEM on April 1 of every year of the Rule summarizing the prior year's activities.		
Long-term monitoring	• Pre-construction marine mammal surveys will provide a baseline set of data for comparison against the monitoring efforts during construction. • Monitoring will be applied during O&M activities. • Post-construction marine mammal surveys will provide for an assessment of the potential long-term impacts of the Project. • Survey will involve a combination of visual and acoustic monitoring techniques. • Long-term monitoring will be applied during O&M activities.	Marine mammals	BOEM, BSEE, and NMFS
Operational monitoring	Visual monitoring and PAM for marine mammals will occur during vessel transits to and from the Project Area as described above under vessel speed restrictions (standard and adaptive plans).	Marine mammals	BOEM, BSEE, and NMFS
Impact Pile Driving			
PAM for impact pile driving	• 4-hour PAM operator rotations for 24-hour operation vessels. • Deployment of PAM systems will be outside the perimeter of the shutdown zone. • There will be a PAM operator on duty conducting acoustic monitoring in coordination with the visual PSOs during all pre-start clearance periods, piling, and post-piling monitoring periods. • Passive acoustic monitoring will include and extend beyond the largest shutdown zone for low- and mid-frequency cetaceans. • Mitigation zones established for all species, including NARW will be applied accordingly depending on the season in which work is performed, summer (May-November) or winter (December-April).	Marine mammals	BOEM, BSEE, and NMFS
Visual monitoring for impact pile driving	• Six to eight visual PSOs and PAM operators (may be located on shore) on the pile driving vessel and four to eight visual PSOs and PAM operators on any secondary marine mammal monitoring vessel. • Two visual PSOs will hold watch on each construction and secondary vessel during pre-start clearance, throughout pile driving, and 30 minutes after piling is completed. • PSOs will visually monitor the harbor porpoise, pinniped, and dolphin shutdown zones. • The secondary vessel will be positioned and circling at the outer limit of the low-frequency and mid-frequency cetacean shutdown zone. PSOs stationed on the secondary vessel will	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	ensure the outer portion of the shutdown zones and pre-start clearance zone are visually monitored.		
Daytime visual monitoring for impact pile driving (daytime visual monitoring is defined by the period between nautical twilight rise and set for the region)	• Visual PSOs should begin surveying the monitoring zone at least 60 minutes prior to the start of pile driving. • PSOs will monitor for 30 minutes after each piling event. • PSOs will monitor the shutdown zone with the naked eye and reticle binoculars while one PSO periodically scans outside the shutdown zone using the mounted "big eye" binoculars. • The secondary vessel will be positioned and circling at the outer limit of Large Whale shutdown zone. • Monitoring equipment and personnel planned for use during standard daytime and low-visibility and nighttime piling is presented in Table H-1a.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

<table>
<tr><th>Measure Number / Name</th><th>Table H-1
Description of Applicant Proposed Measure</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[1]</th></tr>
<tr><td></td><td>Table H-1a. Personnel and Equipment Use for all Marine Mammal Monitoring Vessels During Pre-start Clearance, Foundation Impact Pile Driving, and Post Piling Monitoring (adapted from Table 12 in the Protected Species Mitigation and Monitoring Plan [Sunrise Wind 2022b]).
<table>
<tr><th rowspan="2">Item</th><th colspan="2">Standard Daytime</th><th colspan="2">Monitoring for Nighttime and Low Visibility</th></tr>
<tr><th>Number on Construction Vessel</th><th>Number on Secondary Vessel</th><th>Number on Construction Vessel</th><th>Number on Secondary Vessel</th></tr>
<tr><td>Visual PSOs on watch</td><td>2</td><td>2</td><td>2</td><td>2</td></tr>
<tr><td>PAM operators on duty[1]</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>Reticle binoculars</td><td>2</td><td>2</td><td>0</td><td>0</td></tr>
<tr><td>Mounted thermal/IR camera system[2]</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>Mounted "big-eye" binocular</td><td>1</td><td>1</td><td>0</td><td>0</td></tr>
<tr><td>Monitoring station for real time PAM system[3]</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>Hand-held or wearable NVDs</td><td>0</td><td>0</td><td>2</td><td>2</td></tr>
<tr><td>IR spotlights</td><td>0</td><td>0</td><td>2</td><td>2</td></tr>
<tr><td>Data collection software system</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>PSO-dedicated VHF radios</td><td>2</td><td>2</td><td>2</td><td>2</td></tr>
<tr><td>Digital single-lens reflex camera equipped with 300-mm lens</td><td>1</td><td>1</td><td>0</td><td>0</td></tr>
</table>
[1] PAM operator may be stationed on the vessel or at an alternative monitoring location.
[2] The camera systems will be automated with detection alerts that will be checked by a PSO on duty; however, cameras will not be manned by a dedicated observer.
[3] The selected PAM system will transmit real time data to PAM monitoring stations on the vessels and/or a shore side monitoring station.</td><td></td><td></td></tr>
<tr><td>Daytime periods of reduced visibility for impact pile driving</td><td>If the Level B harassment zone is obscured, the two PSOs on watch will continue to monitor the shutdown zone using thermal camera systems, handheld night-vision devices (NVD) and mounted infrared camera (as able).
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.</td><td>Marine mammals, sea turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
</table>

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Nighttime visibility for construction and secondary vessels	• Pile driving during nighttime hours could potentially occur when a pile installation is started during daylight and, due to unforeseen circumstances, would need to be finished after dark. New piles could be initiated after dark to meet schedule requirements. • Visual PSOs will rotate in pairs: one observing with a handheld NVD and one monitoring the infrared (IR) thermal imaging camera system[2]. There will also be a PAM operator on duty conducting acoustic monitoring in coordination with the visual PSOs. • The mounted thermal cameras may have automated detection systems or require manual monitoring by a PSO. • PSOs will focus their observation effort during nighttime watch periods within the shutdown zones and waters immediately adjacent to the vessel. • If possible, 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 NVD in areas away from potential interference by these lights. If a PSO is unable to monitor the visual clearance or shutdown zones with available NVDs. Piling will not commence or will be halted (as safe to do so).	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Acoustic monitoring during impact pile driving	• PAM operator will monitor during all pre-start clearance periods, piling, and post-piling monitoring periods (daylight, reduced visibility, and nighttime monitoring). • PAM should begin at least 60 minutes prior to the start of piling. • One PAM operator on duty during both daytime and nighttime/low visibility monitoring. • Since visual observations within the applicable shutdown zones can become impaired at night or during daylight hours due to fog, rain, or high sea states, visual monitoring with thermal and NVDs will be supplemented by PAM during these periods. • PAM operator will monitor during all pre-start clearance periods, piling, and post-piling monitoring periods (daylight, reduced visibility, and nighttime monitoring). • 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.	Marine mammals	BOEM, BSEE, and NMFS

[2] In support of the request for nighttime piling, Ørsted is assessing the opportunity to conduct a marine mammal monitoring field demonstration project in the spring of 2022. Additional details on the project and further engagement will follow.

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• PAM operator will inform the PSOs on duty of animal detections approaching or within applicable ranges of interest to the pile-driving activity. The PAM system will be deployed with a capability of monitoring up to 10 km (6.2 mi) radii from the pile. • A PAM Plan must be submitted to NMFS and BOEM for review and approval at least 90 days prior to the planned start of pile driving. • It is expected there will be a PAM operator stationed on at least one of the dedicated monitoring vessels in addition to the PSOs or located remotely/onshore. • PAM operators will complete specialized training for operating PAM systems prior to the start of monitoring activities. • All on-duty PSOs will be in contact with the PAM operator on duty, who will monitor the PAM systems for acoustic detections of marine mammals that are vocalizing in the area. • Acoustic monitoring during nighttime and low visibility conditions during the day will complement visual monitoring (e.g., PSOs and thermal cameras) and will cover an area of at least the shutdown zone around each foundation.		
Shutdown zones for impact pile driving	• Summer distances were determined from the modeling conducted assuming a summer sound speed profile. These distances will be used to implement shutdown zones during the months identified in the acoustic modeling report as being represented by the summer sound speed profile (April – November). Winter distances were determined from the modeling conducted assuming a winter sound speed profile. These distances will be used to implement shutdown zones during the months identified in the acoustic modeling report as being represented by the winter sound speed profile (December).	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

<table>
<tr><th>Measure Number / Name</th><th>Table H-1
Description of Applicant Proposed Measure</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[1]</th></tr>
<tr><td></td><td>
Table H-1b. Summary of Shutdown Zones[1,2] During Impact Pile Driving for Summer (April through November) and Winter (December only) with 10 Decibel Broadband Sound Attenuation (Sunrise Wind 2022c)
<table>
<tr><th>Species</th><th>WTG Summer Distances (May through November)</th><th>WTG Winter Distances (December)</th><th>OCS-DC Summer Distances (May through November)</th><th>OCS-DC S Winter Distances (December)</th></tr>
<tr><td>NARW Visual Detection</td><td>At any distance</td><td>At any distance</td><td>At any distance</td><td>At any distance</td></tr>
<tr><td>NARW Acoustic Detection</td><td>3,700 m</td><td>4,300 m</td><td>5,600 m</td><td>6,500 m</td></tr>
<tr><td>Mysticete whales (low frequency cetaceans)</td><td>3,700 m</td><td>4,300 m</td><td>5,600 m</td><td>6,500 m</td></tr>
<tr><td>Sperm whale (mid-frequency cetacean)</td><td>3,700 m</td><td>4,300 m</td><td>5,600 m</td><td>6,500 m</td></tr>
<tr><td>Mid-frequency cetaceans (except sperm whales)</td><td>NAS perimeter</td><td>NAS perimeter</td><td>NAS perimeter</td><td>NAS perimeter</td></tr>
<tr><td>Harbor Porpoise (high frequency cetacean)</td><td>200 m</td><td>NAS perimeter</td><td>900 m</td><td>600 m</td></tr>
<tr><td>Seals</td><td>100 m</td><td>100 m</td><td>1,800 m</td><td>1,800 m</td></tr>
</table>
[1]Clearance and shutdown zones will be monitored using a combination of visual and acoustic methods.

[2]Shutdowns may be initiated by either visual or acoustic detection. Only acoustic detections that meet criteria (e.g., localization) for determining that the call originated inside the given zone will be considered for mitigation.
</td><td></td><td></td></tr>
<tr><td>Pre-start clearance for</td><td>• Piling may be initiated any time within a 24-hour period.
• A 60-minute pre-start clearance period will be implemented for impact pile driving activities.</td><td>Marine mammals, sea turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
</table>

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
impact pile driving	• Prior to the beginning of each pile driving event, visual PSOs and PAM operators will monitor the Level B harassment zone at least 60 minutes prior to the start of pile driving, during all pile driving activities, and continue at all times during impact pile driving. • All clearance zones will be confirmed to be free of marine mammals and sea turtles prior to initiating ramp-up and large whale clearance zone (3,700 m [3.7 km or 2.3 mi] or as modified) will be fully visible, and the NARW acoustic zone monitored for at least 30 minutes prior to commencing ramp-up. • If a marine mammal or sea turtle 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) or sea turtle(s) has voluntarily left the respective clearance zones and has been visually or acoustically confirmed beyond that 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).		
Ramp-up (soft start) for impact pile driving	• Ramp-up is required prior to the initiation of high-resolution geophysical (HRG) sources (boomers, sparkers, Climate Hazards Center Infrared Precipitation with Stations Data [CHIRPS]) • Each monopile installation will begin with a minimum of 20-minute soft-start procedure as technically feasible. • Soft-start procedure will not begin until the clearance zone has been cleared by the visual PSO or PAM operators. • If a marine mammal is detected within or about to enter the applicable clearance zone (or a NARW sighted at any distance), prior to or during the soft-start procedure, pile driving will be delayed until the animal has been observed exiting the 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
Shutdowns for impact pile driving	• If a marine mammal is detected entering or within the respective shutdown zones after pile driving has commenced, an immediate shutdown of pile driving will be implemented unless Sunrise Wind determines shutdown is not feasible due to an imminent risk of injury or loss of life to an individual. • If shutdown is called for and Sunrise Wind and/or its contractor determines shutdown is not feasible due to risk of injury or loss of life, there will be a reduction of hammer energy.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• Following shutdown, pile driving will only be reinitiated once all shutdown zones are confirmed by PSOs to be clear of marine mammals for the minimum species-specific time periods. • The shutdown zone will be continually monitored by PSOs and PAM operators during any pauses in pile driving. • If a marine mammal is sighted within the shutdown zones during a pause in piling, piling will be delayed until the animal(s) has moved outside the shutdown zone and no marine mammals are sighted for a period of 15 minutes for dolphins, porpoises, and seals, and 30 minutes for whales, including the NARW.		
Post-impact piling monitoring	PSOs will continue to survey the shutdown zones 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
Noise attenuation systems (NAS) during impact pile driving	The Project will use NAS for all piling events. The Project is committed to achieving the modeled ranges associated with 10 decibel (dB) of broadband noise attenuation of impact pile driving sounds source levels or smaller ranges, as described in Section 6.3.2 of the Incidental Take Authorization (ITA) Application. The type and number of NAS to be used during construction have not yet been determined but will consist of a double big bubble curtain or a single bubble curtain paired with an additional sound attenuation device. Based on prior measurements this combination of NAS is reasonably expected to achieve greater than 10 dB broadband attenuation of impact pile driving sounds. A PSMMP will describe mitigation measures developed in coordination with BOEM and NOAA Fisheries, and these measures will be included within the Letter of Authorization issued for the Project.	Marine mammals, sea turtles, ESA-listed fish, EFH, finfish	BOEM, BSEE, and NMFS
Sound field verification of foundation installation	• Measurements of the installation of at least three monopile foundations will be made and results used to modify shutdown zones, as appropriate. • For each monopile measures, Sunrise Wind will estimate ranges to Level A and Level B harassment isopleths by extrapolating from in-situ measurements at multiple distances from the monopile including at least one measurement location of 750 m (2,461 ft) from the monopile. • A Sound Field Verification (SFV) Plan will be submitted to NMFS for review and approval at least 90 days prior to planned monitoring and mitigation distances.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• This will include procedures for how measurement results will be used to justify any requested changes to planned monitoring and mitigation distances.		
Impact pile driving reporting	• All data recording will be conducted using Mysticetus software. • Operations, monitoring conditions, observation effort, all marine mammal detections, any mitigation actions, and any other recording requirements will be recorded. • Members of the monitoring team must consult NMFS' NARW reporting systems for the presence of NARWs in the Project Area. • DMAs will be reported across all Project vessels. • Additional details regarding reporting are provided below under "Reporting" In the PSMMP. • Sunrise Wind must submit weekly PSO and PAM monitoring reports to United States Department of Interior (DOI) and NMFS during pile driving. Weekly reports must document the daily start and stop times of all pile driving, the daily start and stop times of associated observation periods by the PSOs, details on the deployment of PSOs, and all detections of marine mammals and sea turtles. The weekly reports must be submitted to BOEM (renewable_reporting@boem.gov), BSEE (via TIMSWeb), and NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division (nmfs.gar.incidental-take@noaa.gov). Beginning in Year 2 of operations, Sunrise Wind must 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 activity, and all observations of ESA-listed species. The annual reports must be submitted to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb).	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Vibratory Pile Driving			
Monitoring equipment	• Two sets of reticle binoculars • Two handheld or wearable NVDs • Two infrared spotlights • One data collection software system • Two PSO-dedicated VHF radios • One digital single-lens reflect camera equipped with a 300-mm lens	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Visual monitoring for	• All observations will take place from one of the construction vessels stationed at or near the vibratory piling location.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
vibratory pile driving	• Two PSOs on duty on the construction vessel. • No PAM operations will be utilized due to the likelihood of masking effects of the vibratory sheet pile driving activities which will result in ineffective acoustic monitoring opportunities. • PSOs will continue to survey the clearance and shutdown zones using visual protocols throughout the installation of each cofferdam sheet pile and for a minimum of 30 minutes after piling has been completed.		
Daytime visual monitoring for vibratory pile driving	• Two PSOs will concurrently maintain watch from the construction or support vessel during the pre-start clearance period, throughout vibratory pile driving, and 30 minutes after piling is completed. • Two PSOs will conduct observations concurrently. • One observer will monitor the clearance and shutdown zones with the naked eye and reticle binoculars; one PSO will monitor in the same way but will periodically scan outside the clearance and shutdown zones using the mounted "big eye" binoculars.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Daytime visual monitoring during periods of low visibility for vibratory pile driving	One PSO will monitor the clearance and shutdown zones with the mounted infrared camera while the other maintains visual watch with the naked eye/binoculars.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Nighttime visual monitoring for vibratory pile driving	Construction at the landfall site will not occur at night.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Shutdown zones for vibratory pile driving	Shutdown zones and pre-clearance zones for Project vibratory sheet pile-driving activities are presented below in Table H-1c.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

<table>
<tr><th>Measure Number / Name</th><th>Table H-1
Description of Applicant Proposed Measure</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[1]</th></tr>
<tr><td></td><td>Table H-1c. Shutdown Zones for Vibratory Sheet Pile Driving and Casing Pipe Impact Pile Driving (Sunrise Wind 2022c)
<table>
<tr><th>Species</th><th>Vibratory Sheet Pile Driving Shutdown Zone (m)</th><th>Casing Pipe Impact Pile Driving Shutdown Zone (m)</th></tr>
<tr><td>Mysticete whales (low-frequency cetaceans)</td><td>50</td><td>500</td></tr>
<tr><td>Sperm whale (mid-frequency cetacean)</td><td>50</td><td>100</td></tr>
<tr><td>Mid-Frequency Cetaceans except sperm whales</td><td>50</td><td>100</td></tr>
<tr><td>Harbor Porpoise (high-frequency cetacean)</td><td>200</td><td>500</td></tr>
<tr><td>Seals</td><td>10</td><td>100</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>Pre-start clearance for vibratory pile driving</td><td>• PSOs will monitor the clearance zone for 30 minutes prior to the start of vibratory pile driving.
• If a marine mammal or sea turtle is observed entering or within the respective clearance zones, piling cannot commence until the animal(s) has exited the clearance zone or time has elapsed since the last sighting (30 minutes for large whales (low-frequency cetaceans and sperm whales), 15 minutes for dolphins (mid-frequency cetaceans), porpoises (high-frequency cetaceans), and pinnipeds, 60 minutes for sea turtles).</td><td>Marine mammals, sea turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>Shutdowns for vibratory pile driving</td><td>• If a marine mammal or sea turtle is observed entering or within the respective shutdown zones after sheet pile installation has commenced, a shutdown will be implemented as long as health and safety is not compromised.
• The shutdown zone 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 shutdown zone and no marine mammals are sighted for a period of 30 minutes for whales, including the NARW, 15 minutes for dolphins, porpoises and pinnipeds, and 60 minutes for sea turtles.</td><td>Marine mammals, sea turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>Reporting</td><td>• All data recording will be conducted using Mysticetus software.</td><td>Marine mammals, sea turtles</td><td>BOEM, BSEE, and NMFS</td></tr>
</table>

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• Operations, monitoring conditions, observation effort, all marine mammal detections, any mitigation actions, and any other recording requirements prescribed by NMFS will be recorded. • Members of the monitoring team must consult NMFS' NARW reporting systems for the presence of NARWs in the Project Area. • DMAs will be reported across all Project vessels. • Sunrise Wind must submit weekly PSO and PAM monitoring reports to DOI and NMFS during pile driving. Weekly reports must document the daily start and stop times of all pile driving, the daily start and stop times of associated observation periods by the PSOs, details on the deployment of PSOs, and all detections of marine mammals and sea turtles. The weekly reports must be submitted to BOEM (renewable_reporting@boem.gov), BSEE (via TIMSWeb), and NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division (nmfs.gar.incidental-take@noaa.gov). • Beginning in Year 2 of operations, Sunrise Wind must 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 activity, and all observations of ESA-listed species. The annual reports must be submitted to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb).		
SFV Plan	• Measurements of the installation of sheet piles using a vibratory hammer will be made during landfall construction activities. • Measurements will provide verification of modeled ranges to the harassment threshold isopleths and provide sound measurement data collected using International Organization for Standardization (ISO)-standard methodology for comparison among projects and to inform future projects. • An SFV Plan will be submitted to NMFS for review and approval at least 90 days prior the planned start of vibratory and/or impulsive pile driving for landfall construction.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
HRG Surveys			
General HRG surveys	• The following mitigation and monitoring measures for HRG surveys apply only to sound sources with operating frequencies below 180 kilohertz (kHz). There are no mitigation or monitoring protocols required for sources operating greater than 180 kHz.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• Shutdown, pre-start clearance, and ramp-up procedures will not be conducted during HRG survey operations using only non-impulsive sources (e.g., ultra-short baseline and parametric sub-bottom profilers [SBPs]) other than non-parametric SBPs (e.g., CHIRPs). Pre-clearance and ramp-up, but not shutdown, will be conducted when using non-impulsive, non-parametric SBPs.		
Monitoring equipment for HRG surveys	• Two pairs of reticle binoculars • One mounted thermal/infrared camera system during nighttime and low visibility conditions • Two handheld or wearable NVDs • Two infrared spotlights • One data collection software system • Two PSO-dedicated VHF radios • One digital single-lens reflex camera equipped with a 300-mm lens	Marine mammals	BOEM, BSEE, and NMFS
Visual monitoring for HRG surveys	• Four to six PSOs on all 24-hour survey vessels • Two to three PSOs on all daylight only (approximately 12-hour) survey vessels • The PSOs will begin observation of the shutdown zones prior to the initiation of HRG survey operations and will continue throughout the survey activity and/or while equipment operating below 180 kHz is in use. • PSOs will monitor the NMFS NARW reporting systems including WhaleAlert and RWSAS once every 4-hour shift during Project-related activities. The number and locations of recorders may be reduced to measurements conducted in open water locations due to the presence of land nearby. The distances at which acoustic recorders are placed from the landfall construction will be determined based on the modeled distances to the acoustic thresholds for vibratory pile driving (April 2022 PSMMP).	Marine mammals	BOEM, BSEE, and NMFS
Daytime visual monitoring (period between nautical twilight rise and set for the	• One PSO on watch during all pre-clearance and all source operations and 30 minutes post operations. • PSOs will use reticle binoculars and the naked eye to scan the monitoring zone for marine mammals.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
region) for HRG surveys			
Autonomous Surface Vehicle (ASV) operations for HRG surveys	Should an ASV be utilized during surveys, the following procedures will be implemented: • PSOs will be stationed aboard the mother vessel to monitor the ASV in a location which will offer a clear, unobstructed view of the ASV's shutdown and monitoring zones. • When in use, the ASV will be within 800 m (2,625 ft) of the primary vessel while conducting survey operations. • For monitoring around an ASV, if utilized, a dual thermal/high definition (HD) camera will be installed on the mother vessel facing forward and angled in a direction so as to provide a field of view ahead of the vessel and around the ASV. • PSOs will be able to monitor the real-time output of the camera on handheld iPads. Images from the cameras can be captured for review and to assist in verifying species identification. • A monitor will also be installed on the bridge displaying the real-time picture from the thermal/HD camera installed on the front of the ASV itself, providing an additional forward field of view of the craft. • Night-vision goggles with thermal clip-ons, as mentioned above, and a handheld spotlight will be provided such that PSOs can focus observations in any direction around the mother vessel and/or the ASV.	Marine mammals	BOEM, BSEE, and NMFS
Nighttime and low visibility visual observations for HRG surveys	• The lead PSO will determine if conditions warrant implementing reduced visibility protocols. • Two PSOs on watch during all pre-clearance periods, all operations, and for 30 minutes following use of HRG sources operating below 180 kHz. • Each PSO will use the most appropriate available technology (i.e., infrared camera and night-vision device) and viewing locations to monitor the shutdown zones and maintain vessel separation distances.	Marine mammals	BOEM, BSEE, and NMFS
Pre-start clearance for HRG surveys	• Pre-start clearance survey will only be conducted for non-impulsive, non-parametric SBPs and impulsive, non-parametric HRG survey equipment other than CHIRP SBPs operating at frequencies greater than 180 kHz. • Prior to the initiation of equipment ramp-up, PSOs and PAM operators will conduct a 30-minute watch of the shutdown zones to monitor for marine mammals.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• The shutdown zones must be visible using the naked eye or appropriate visual technology during the entire clearance period for operations to start; if the shutdown zones are not visible, source operations less than 180 kHz will not commence. • Ramp-up may not be initiated if any marine mammal(s) is detected within its respective shutdown zone. • If a marine mammal is observed within its respective shutdown zone during the pre-clearance period, ramp-up will not begin until the animal(s) has been observed exiting its respective shutdown zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes, 30 minutes for all other marine mammals).		
Ramp-up (soft start) for HRG surveys	• Ramp-ups will only be conducted for non-impulsive, non-parametric SBPs and impulsive, non-parametric HRG survey equipment other than CHIRP SBPs operating at frequencies less than 180 kHz. • Where technically feasible, a ramp-up procedure will be used for HRG survey equipment capable of adjusting energy levels at the start or restart of HRG survey activities. Ramp-up procedures provide additional protection to marine mammals near the Project Area by allowing them to vacate the area prior to the commencement of survey equipment use at full power. • Ramp-up will not be initiated during periods of inclement conditions or if the shutdown zones cannot be adequately monitored by the PSOs, using the appropriate visual technology for a 30-minute period. • Ramp-up will begin by powering up the smallest acoustic HRG equipment at its lowest practical power output. When technically feasible, the power will then be gradually turned up and all other acoustic sources added in a way such that the source level would increase cautiously. • If a marine mammal is detected within or about to enter its respective shutdown zone, ramp-up will be delayed. • Ramp-up will continue once the animal(s) has been observed exiting its respective shutdown zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for small odontocetes, 30 minutes for all other marine mammal species).	Marine mammals	BOEM, BSEE, and NMFS
Shutdowns for HRG surveys	• Shutdown of impulsive, non-parametric HRG survey equipment other than CHRIP SBPs operating at frequencies greater than 180 kHz is required if a marine mammal is sighted at or within its respective shutdown zone.	Marine mammals	BOEM, BSEE, and NMFS

<table>
<tr><th>Measure Number / Name</th><th>Table H-1
Description of Applicant Proposed Measure</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[1]</th></tr>
<tr><td></td><td>• Shutdowns will not be implemented for dolphins that voluntarily approach the survey vessel.
• Subsequent restart of the survey equipment will be initiated using the same procedure described under pre-start clearance.
• 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 shutdown zones.
• 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.</td><td></td><td></td></tr>
<tr><td>Shutdown zones for HRG surveys</td><td>• Shutdowns will only be conducted for impulsive, non-parametric HRG survey equipment other than CHIRP SBPs operating at frequencies less than 180 kHz.
• Table H-1d describes the standard mitigation and harassment zones established for HRG survey activities.

Table H-1d. Shutdown Zones for HRG Surveys (Sunrise Wind 2022c)
<table><tr><th>Species</th><th>Shutdown Zone (m)</th></tr><tr><td>Mysticete Whales (Low-Frequency Cetaceans), excluding NARW</td><td>100</td></tr><tr><td>NARW</td><td>500</td></tr><tr><td>Sperm whale, Risso's dolphin, long-finned pilot whale, and short-finned pilot whale (mid frequency cetaceans)</td><td>100</td></tr><tr><td>Harbor porpoise (High-Frequency Cetacean)</td><td>100</td></tr><tr><td>Seals</td><td>100</td></tr></table>
Notes: No shutdown zone mitigation measures will be applied for Atlantic white-sided dolphin, Atlantic spotted dolphin, short-beaked common dolphin, and bottlenose dolphin offshore, so the shutdown zone for medium-frequency cetaceans is not applicable to these four species.</td><td>Marine mammals</td><td>BOEM, BSEE, and NMFS</td></tr>
<tr><td>Post-construction HRG survey reporting</td><td>• All data recording will be conducted using Mysticetus or similar software.
• Operations, monitoring conditions, observation effort, all marine mammal detections, and any mitigation actions will be recorded.</td><td>Marine mammals</td><td>BOEM, BSEE, and NMFS</td></tr>
</table>

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• Post construction, Sunrise Wind will provide to BOEM and NMFS a final report annually for HRG survey activities. The final report must address any comments on the draft report provided to Sunrise Wind by BOEM and NMFS. The report must include a summary of survey activities, all PSO and incident reports, and an estimate of the number of listed marine mammals observed and/or taken during these survey activities. • DMAs will be reported across all vessels.		
Unexploded Ordinances/Munitions of Explosive Concern Disposal			
General UXO/MEC disposal	For UXO/MECs that are positively identified in proximity to planned activities on the seabed, several alternative strategies will be considered prior to detonating the UXO/MEC in place. These may include relocating the activity away from the UXO/MEC (avoidance), moving the UXO/MEC away from the activity (lift and shift), cutting the UXO/MEC open to apportion large ammunition or deactivate fused munitions, using shaped charges to reduce the net explosive yield of a UXO/MEC (low-order detonation), or using shaped charges to ignite the explosive materials and allow them to burn at a slow rate rather than detonate instantaneously (deflagration). Only after these alternatives are considered would a decision to detonate the UXO/MEC in place be made. If deflagration is conducted, mitigation and a monitoring measure would be implemented as if it was a high order detonation based on UXO/MEC size. Decision on removal method will be made in consultation with a UXO/MEC specialist and in coordination with the agencies with regulatory oversite of UXO/MEC. For detonation that cannot be avoided due to safety considerations, a number of mitigation measures will be employed by Sunrise Wind. No more than a single UXO/MEC will be detonated within a 24-hour period.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Visual monitoring equipment for UXO/MEC disposal	Monitoring Equipment would consist of: • Two visual PSOs and one PAM operator will be on watch on each PSO vessel. • There will be a team of six to eight visual and acoustic PSOs on UXO monitoring vessels. • A single vessel is anticipated to adequately cover a radius of 2,000 m (2 km or 1.2 mi). The number of vessels will depend on the size of the zones to be monitored. • PAM operators may be located remotely/onshore. • Two reticle binoculars. • One pair of mounted "big eye" binoculars.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS

<table>
<tr><th>Measure Number / Name</th><th>Table H-1
Description of Applicant Proposed Measure</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[1]</th></tr>
<tr><td></td><td>• One monitoring station for real time PAM system.
• One data collection software system.
• Two PSO-dedicated VHF radios.
• Digital single-lens reflex camera equipped with 300-mm lens.</td><td></td><td></td></tr>
<tr><td>Pre-start clearance for UXO/MEC disposal</td><td>All mitigation and monitoring zones assume the use of a NAS resulting in a 10 dB reduction of noise levels. Mitigation and monitoring zones specific to marine mammal hearing groups for the five different charge weight bins are included below as summarized from the Propagation Modeling Report for the Project.

Table H-1e. Mitigation and Monitoring Zones Associated with In-Situ UXO/MEC Detonation of Binned Charged Weights, with a 10 dB Noise Attenuation System for the Sunrise Wind Farm (as adopted from Table 53, Sunrise Wind 2022c).

<table>
<tr><th rowspan="3">Marine Mammal Hearing Groups</th><th colspan="10">Unexploded Ordinances/Munitions of Explosive Concern Charge Weight[1]</th></tr>
<tr><th colspan="2">E4 (2.3kg)</th><th colspan="2">E6 (9.1 kg)</th><th colspan="2">E8 (45.4 kg)</th><th colspan="2">E10 (227 kg)</th><th colspan="2">E12 (454 kg)</th></tr>
<tr><th>Pre-Start Clearance Zone[2] (m)</th><th>Level B Harassment Zone[3] (m)</th><th>Pre-Start Clearance Zone (m)</th><th>Level B Harassment Zone (m)</th><th>Pre-Start Clearance Zone (m)</th><th>Level B Harassment Zone (m)</th><th>Pre-Start Clearance Zone (m)</th><th>Level B Harassment Zone (m)</th><th>Pre-Start Clearance Zone (m)</th><th>Level B Harassment Zone (m)</th></tr>
<tr><td>Low-Frequency Cetaceans</td><td>400</td><td>2,800</td><td>800</td><td>4,500</td><td>1,600</td><td>7,300</td><td>3,000</td><td>10,300</td><td>3,700</td><td>11,800</td></tr>
<tr><td>Mid-Frequency Cetaceans</td><td>50</td><td>500</td><td>50</td><td>800</td><td>100</td><td>1,300</td><td>400</td><td>2,100</td><td>500</td><td>2,500</td></tr>
<tr><td>High-Frequency Cetaceans</td><td>1,800</td><td>6,200</td><td>2,600</td><td>7,900</td><td>3,900</td><td>10,100</td><td>5,400</td><td>12,600</td><td>6,200</td><td>13,700</td></tr>
<tr><td>Phocid Pinnipeds</td><td>100</td><td>1,300</td><td>250</td><td>2,200</td><td>600</td><td>3,900</td><td>1,100</td><td>6,000</td><td>1,500</td><td>7,100</td></tr>
</table>
kg = kilograms; m = meters
[1] UXO/MEC (Unexploded Ordinances/Munitions of Explosive Concern) charge weights are groups of similar munitions defined by the U.S. Navy and binned into five categories (E4 – E12) by weight (equivalent weight</td><td>Marine mammals, sea turtles</td><td>BOEM, BSEE, NMFS</td></tr>
</table>

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]

in TNT). For this assessment, four project sites (S1-S4) were chosen and modeled (see Hannay and Zykov 2021) for the detonation of each charge weight bin.

[2]Pre-start clearance zones were calculated by selecting the largest Level A threshold (the larger of either the PK or SEL noise metric). The chosen values were the most conservative per charge weight bin across each of the four modeled sites. A 20 percent buffer was then added to the modeled distances and zones were rounded up for the PSO clarity.

[3]Level B harassment zones were calculated by selecting the largest temporary threshold shift (the larger of either the PK or SEL noise metric). The chosen values were the most conservative per charge weight bin across each of the two modeled sites representative of the SRWF.

Table H-1f. Mitigation and Monitoring Zones Associated with Unmitigated Unexploded Ordinances/Munitions of Explosive Concern Detonation of Binned Charge Weights for the Sunrise Wind Farm (Table 54, Sunrise Wind 2022c)

Marine Mammal Hearing Groups	UXO/MEC Charge Weight[1]									
	E4 (2.3 kg)		E6 (9.1 kg)		E8 (45.5 kg)		E10 (227 kg)		E12 (454 kg)	
	Pre-Start Clearance Zone[2] (m)	Level B Monitoring Zone[3] (m)	Pre-Start Clearance Zone (m)	Level B Monitoring Zone (m)	Pre-Start Clearance Zone (m)	Level B Monitoring Zone (m)	Pre-Start Clearance Zone (m)	Level B Monitoring Zone (m)	Pre-Start Clearance Zone (m)	Level B Monitoring Zone (m)
Low-Frequency Cetaceans	1,710	7,340	2,810	10,300	4,800	13,900	7,520	17,500	8,800	19,300
Mid-Frequency Cetaceans	214	1,520	385	2,290	714	3,490	1,220	5,040	1,540	5,860
High-Frequency Cetaceans	4,300	11,200	5,750	13,400	7,810	16,000	12,775	19,100	16,098	20,200
Phocid Pinnipeds	804	4,200	1,310	6,200	2,190	9,060	3,740	12,000	4,520	13,300

* = denotes species listed under the Endangered Species Act; kg =kilograms; m = meters; PK = peak pressure level; SEL = sound exposure level.

[1]UXO/MEC (Unexploded Ordinances/Munitions of Explosive Concern) charge weights are groups of similar munitions defined by the U.S. Navy and binned into five categories (E4-E12) by weight (equivalent weight in TNT). For this assessment, four project sites (S1-S4) were chosen and modeled (see Hannay and Zykov 2021) for the detonation of each charge weight bin.

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	[2]Pre-start clearance zones were calculated by selecting the largest Level A threshold (the larger of either the PK or SEL noise metric). The chosen values were the most conservative per charge weight bin across each of the four modeled sites. [3]Level B monitoring zones were calculated by selecting the largest TTS threshold (the larger of either the PK or SEL noise metric). The chosen values were the most conservative per charge weight bin across each of the four modeled sites. • A 60-minute pre-start clearance period will be implemented prior to any in-situ UXO/MEC detonation. • The maximum low frequency Level A zone, which constitutes the pre-start clearance zone (see Table H-1e and Table H-1f above) must be fully visible for at least 60 minutes prior to commencing detonation. • All marine mammals must be confirmed to be out of the clearance zone prior to initiating detonation. • If a marine mammal is observed entering or within the relevant clearance zones prior to the initiation of detonation, the detonation must be delayed. • The detonation may commence when either the marine mammal(s) has voluntarily left the respective clearance zone and been visually confirmed beyond that clearance zone, or when 60 minutes have elapsed without redetection for whales, including the NARW, or 15 minutes have elapsed without redetection of dolphins, porpoises, and seals.		
Visual monitoring during UXO/MEC detonations (vessel monitoring)	• The number of vessels deployed will depend on Level B harassment zone size and safety set back distance from detonation. A sufficient number of vessels will be deployed to cover the pre-start clearance and shutdown zones 100 percent. • PSOs will visually monitor the maximum low frequency (large whale) Level A zone which constitutes the pre-start clearance zone. This zone encompasses the maximum Level A exposure ranges for all marine mammal species except harbor porpoise, where Level A take has been requested due to the large zone sizes associated with high frequency cetaceans. • During daytime observations, two PSOs on each vessel will monitor the pre-start clearance zones with the naked eye and reticle binoculars; and one PSO will periodically scan outside the pre-start clearance zones using the mounted "big eye" binoculars to document take should the device be detonated while marine mammals are in the area (but outside of the clearance zone)	Marine mammals, sea turtles	BOEM, BSEE, NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	Primary Vessel Measures: • Two PSOs on duty on the primary vessel. • Visual PSOs will survey the Level B harassment zone at least 60 minutes prior to a detonation event. • Two PSOs will maintain watch at all times during the pre-start clearance period and 60-minutes after the detonation event. • There will be a PAM operator on duty conducting acoustic monitoring in coordination with the visual PSOs during all pre-start clearance periods and post-detonation monitoring periods. **Additional Vessel Measures** • Visual monitoring will be conducted on an additional vessel following the same methods as stated for the primary vessel in addition to the following measures when monitoring zones have radii greater than 2,000 m (2 km or 1.2 mi). • Two PSOs on duty on the additional vessel. • Two PSOs will maintain watch at all times during the pre-start clearance period and 60-minutes after the detonation event. • Based on the pre-start clearance zones for low-frequency cetaceans shown in the table above, an additional vessel will be used in the specified locations for the following UXO/MEC charge weight bins: Sunrise Wind Farm Bins E10 and E12.		
Visual monitoring during UXO detonations (aerial alternative)	Aerial surveys are typically limited by low cloud ceilings, aircraft availability, survey duration, and health, safety, and environment considerations and therefore are not considered feasible or practical for all detonation monitoring. However, some scenarios may necessitate the use of an aerial platform. For mitigated or unmitigated detonations with clearance zones greater than 5 km, deployment of sufficient vessels may not be feasible or practical. For these events, visual monitoring will be conducted from an aerial platform. The intent of the aerial visual monitoring is to provide complete visual coverage of the UXO/MEC clearance zones using the following procedures: • During the pre-start clearance period and 60-minutes after the detonation event as flight time allows, two PSOs will be deployed on an aerial platform. • Surveys will be conducted in a grid with a 1-km line spacing, encompassing the clearance zone. • PSOs will monitor the clearance zones with the naked eye and reticle binoculars.	Marine mammals, sea turtles	BOEM, BSEE, NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• Aerial PSOs may exceed 4-hour watch duration but will be limited by total flight duration not likely to exceed 6 hours. • PSOs will visually monitor the maximum low-frequency cetacean (large whale) Level A zone which constitutes the pre-start clearance zones (Table H-1g). This zone encompasses the maximum Level A exposure ranges for all marine mammal species except harbor porpoise, where Level A take has been requested due to the large zone sizes associated with high-frequency cetaceans. • There will be a PAM operator on duty conducting acoustic monitoring in coordination with the visual PSOs during all pre-start clearance periods and post-detonation monitoring periods.		
Time of year/ nighttime restrictions	• No in-situ UXO/MEC detonations are planned between December and April. As part of the federal consistency review for the Project and work in Rhode Island and New York State waters, it is expected that an in-situ UXO/MEC disposal will also be subject to state specific seasonal restrictions. • No UXO will be detonated during nighttime hours.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
PAM during UXO detonations	• Acoustic monitoring will be conducted prior to any UXO detonation event in addition to visual monitoring in order to ensure that no marine mammals are present in the designated pre-clearance zones. • Only one PAM team for all deployed PSO vessels. • PAM operators will acoustically monitor a zone that encompasses a minimum of a 10 km (6.2 mi) radius around the source. • PAM will be conducted in daylight as no UXO will be detonated during nighttime hours. • There will be a PAM operator stationed on at least one of the dedicated monitoring vessels (primary or additional) in addition to the PSOs; or located remotely/onshore. • PAM will begin 60 minutes prior to the detonation event. • PAM operator will be on duty during all pre-start clearance periods and post-detonation monitoring periods. • Acoustic monitoring will include and extend beyond the large whale pre-start clearance zone. • For real-time PAM systems, at least one PAM operator will be designated 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.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• The PAM operator will inform the lead PSO on duty of animal detections approaching or within applicable ranges of interest to the detonation activity via the data collection software system (i.e., Mysticetus or similar system) who will be responsible for requesting the designated crewmember to implement the necessary mitigation procedures. • PAM devices used will include independent (e.g., autonomous or moored remote) systems.		
Noise attenuation for UXO/MEC detonations	Sunrise Wind will use an NAS for all UXO detonation events to reduce sounds propagated into the marine environment as feasible. Sunrise Wind is committed to achieving the modeled ranges associated with 10 dB of broadband noise attenuation of UXO detonation source levels, as is described in Section 6.3.2 of the ITA Application. Zones without 10 dB attenuation would be implemented if use of a big bubble curtain was not feasible due to location, depth, or safety related constraints. If a NAS system is not feasible, Sunrise Wind will implement mitigation measures for the larger unmitigated zone sizes, with deployment of vessels or use of an aerial platform adequate to cover the entire clearance zones.	Marine mammals, sea turtles, ESA-listed fish, EFH, finfish	BOEM, BSEE, and NMFS
Sound measurements for UXO/MEC detonations	• Acoustic measurements will be made during any UXO/MEC detonations. • Measurements will provide verification of modeled ranges to the modeled harassment threshold isopleths and provide acoustic measurement data collected using ISO-standard methodology for comparison among projects and to inform future projects. • A SFV Plan for UXO/MEC detonation will be submitted to NMFS for review and approval at least 90 days prior to planned start of UXO/MEC detonations. • Collect data on approximate source levels, the directionality of the sound produced, and transmission loss in at least one direction. • The distance at which acoustic recorders are placed from the UXO detonation will be determined based on the modeled distances to Level A and Level B thresholds for the applicable UXO size being detonated.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Post-UXO/MEC detonation monitoring	Post-detonation monitoring will occur for 30 minutes.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Reporting	• If a stranded, entangled, injured, or dead protected species is observed, the sighting shall be reported within 24 hours to the NMFS RWSAS Hotline. • In the event a protected species is injured or killed as a result of Project activities, the vessel captain or PSO on board shall report immediately to NMFS OPR, who is able to review the	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance. Additionally, the vessel captain or PSO on board shall report immediate to NMFS OPR and Greater Atlantic Regional Fisheries Office no later than within 24 hours, and NOAA Fisheries Marine Mammal and Sea Turtle Stranding and Entanglement Hotline or alternative electronic reporting systems as approved by the NOAA stranding program, as well as the U.S. Coast Marine Mammals, Sea Turtles Guard. • Any injured or dead ESA or marine mammal species (reporting requiring immediate response) must be reported to BSEE at protectedspecies@bsee.gov. • Any NARW sighting should be reported as soon as feasible and no later than within 24 hours to the NMFS RWSAS hotline or via the Whale Alert Application.		
Fisheries Monitoring			
General measures	• Fisheries monitoring was designed in accordance with recommendations set forth in "*Guidelines for Providing Information on Fisheries for Application for Renewable Energy Development on the Atlantic Outer Continental Shelf*" (BOEM 2019) and consideration to the Responsible Offshore Science Alliance Offshore Wind Project Monitoring Framework and Guidelines. • All vessels will comply with the vessel speed plan as outlined above for vessel speed restrictions – Standard and Adaptive Plans. • Marine mammal watches and monitoring will occur during daylight hours prior to deployment of gear (e.g., trawls, longline gear) and will continue until gear is brought back on board. • If marine mammals are sighted in the area within 15 minutes prior to deployment of gear and are considered to be at risk of interaction with the research gear, then the sampling station is either moved or canceled or the activity is suspended until there are no sightings of any marine mammal for 15 minutes within 1 nautical mile (nm; 1.9 km) of sampling location.	Marine mammals	BOEM, BSEE, and NMFS
Trawl surveys	• Marine mammal monitoring will be conducted by the captain and/or a member of the scientific crew before, during, and after haul back. • The start of the tow will be recorded when the net is fully deployed, and the winches are locked. The end of the tow will be recorded when the winches are engaged to retrieve the net back to the vessel. Therefore, the net will be present in the water for longer than 20 minutes, but will only be actively fishing for the 20-minute tow duration.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
	• Sunrise Wind will initiate marine mammal watches (visual observation) within 1 nm (1.9 km) of the site 15 minutes prior to sampling. • If a marine mammal is sighted within 1 nm (1.9 km) of the planned sampling station in the 15 minutes before gear deployment, Sunrise Wind will delay setting the trawl until marine mammals have not been resighted for 15 minutes or Sunrise Wind may move the vessel away from the marine mammal to a different section of the sampling area. If, after moving on, marine mammals are still visible from the vessel, Sunrise Wind may decide to move again or to skip the sampling station. • Sunrise Wind will maintain visual monitoring effort during the entire period of time that trawl gear is in the water (i.e., throughout gear deployment, fishing, and retrieval). If marine mammals are sighted before the gear is fully removed from the water, (i.e., prior to haul back) the vessel will slow its speed and steer away from the sighted animal in order to minimize potential interactions. Further mitigating actions can be taken following consultation with and guidance from the NMFS Protected Resources Division. • Sunrise Wind will open the codend of the net close to the deck/sorting area to avoid damage to animals that may be caught in gear. • Gear will be emptied as close to the deck/sorting area and as quickly as possible after retrieval. • Trawl nets will be fully cleaned and repaired (if damaged) before setting again. • Sunrise Wind does not anticipate and is not requesting take of marine mammals incidental to research trawl surveys but, in the case of a marine mammal interaction, the Marine Mammal Stranding Network will be contacted immediately.		
Acoustic telemetry surveys	• No specific mitigation relevant to this type of survey. • Vessel mitigation measures outlined above for all Project vessels will be employed while collecting samples.	Marine mammals	BOEM, BSEE, and NMFS
Rod and reel surveys	• No specific mitigation relevant to this type of survey. • Vessel mitigation measures outlined above for all Project vessels will be employed while collecting samples.	Marine mammals	BOEM, BSEE, and NMFS
Clam survey	• No specific mitigation relevant to this type of survey. • Vessel mitigation measures outlined above for all Project vessels will be employed while collecting samples.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Reporting Requirements			
Injured protected species reporting	• Sunrise Wind will ensure that sightings of any injured or dead protected species are reported to the Greater Atlantic (Northeast) Region Marine Mammal and Sea Turtle Stranding and Entanglement Hotline (866-755-NOAA [6622] or current) within 24 hours of sighting, regardless of whether the injury or death is caused by a Project vessel. In addition, if the injury or death was caused by a collision with a Project vessel, Sunrise Wind will ensure that NMFS is notified of the strike within 24-hours. The notification of such strike will include the date and location (latitude/longitude) of the strike, the name of the vessel involved, and the species identification or description of the animal, if possible. If a Project activity is responsible for the injury or death, Sunrise Wind will supply a vessel to assist in any salvage effort as requested by NMFS. • An injured or dead ESA or marine mammal species (reporting requiring immediate response) must be reported to BSEE at protectedspecies@bsee.gov. • If a NARW is involved in any of the above-mentioned incidents, then the vessel captain or PSO onboard should also notify the Right Whale Sighting Advisory System (RWSAS) hotline immediately and no later than within 24 hours.	Marine mammals, sea turtles	BOEM, BSEE, and NMFS
Reporting observed impacts on species	• The observer will report any observations concerning impacts on marine mammals to NMFS within 48 hours. Any observed takes of listed marine mammals resulting in injury or mortality must be reported within 24 hours to NMFS. • BOEM and NMFS will be notified within 24 hours if any evidence of an injured or dead sea turtle or ESA-listed fish species during construction activity is observed. • An injured or dead ESA or marine mammal species (reporting requiring immediate response) must be reported to BSEE at protectedspecies@bsee.gov. • Any NARW sightings will be reported as soon as possible, and no later than within 24 hours, to the NMFS RWSAS hotline or via the Whale Alert Application.	Marine mammals, sea turtles, ESA-listed fish	BOEM, BSEE, and NMFS
Report of activities and observations	Sunrise Wind will provide NMFS and BSEE via TIMSWebwith a report within 90 calendar days following the completion of construction and HRG surveys, including a summary of the activities and an estimate of the number of marine mammals taken during these activities. During construction, weekly reports briefly summarizing sightings, detections, and activities will be provided to NMFS and BOEM on the Wednesday following a Sunday-Saturday period.	Marine mammals	BOEM, BSEE, and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
Report information	• Data on all protected-species observations will be recorded and based on standards of marine mammal observer collection data by the PSOs. This information will include dates, times, and locations of survey operations; time of observation, location and weather; details of marine mammal sightings (e.g., species, numbers, behavior); and details of any observed taking (e.g., behavioral disturbances or injury). • All vessels will utilize a standardized data entry format. • A QA/QC'd database of all sightings and associated details (e.g., distance from vessel, behavior, species, group size/composition) within and outside of the designated shutdown zones, 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 ITA and BOEM Lease OCS-A 0487 and will be required for the Final Technical Report due to BOEM and NMFS. • During construction, weekly reports briefly summarizing sightings, detections and activities will be provided to NMFS and BOEM on the Wednesday following a Sunday-Saturday period. • Final reports will follow a standardized format for PSO reporting from activities requiring marine mammal mitigation and monitoring. • 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. Interim, annual, and final PSO monitoring reports must be submitted to BSEE via TIMSWeb.	Marine mammals	BOEM, BSEE, and NMFS
BOEM Project Design Criteria and Best Management Practices for Protected Species (PDCs/BMPs)			
BOEM PDCs/BMPs	Lessees and grantees must evaluate marine mammal use of the proposed Project Area and must design the Project to minimize and mitigate the potential for mortality or disturbance. The amount and extent of ecological baseline data required shall be determined on a project basis.	Marine mammals, sea turtles, ESA-listed fish	BOEM, and NMFS
BOEM PDCs/BMPs	Vessels related to Project planning, construction, and operation shall travel at reduced speeds when assemblages of cetaceans are observed. Vessels also shall maintain a reasonable distance from whales, small cetaceans, and sea turtles, and these shall be determined during site-specific consultations.	Marine mammals, sea turtles, ESA-listed fish	BOEM and NMFS

Measure Number / Name	Table H-1 Description of Applicant Proposed Measure	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[1]
BOEM PDCs/BMPs	Lessees and grantees must minimize potential vessel impacts to marine mammals and turtles by having Project-related vessels follow the NMFS Regional Viewing Guidelines while in transit. Operators must undergo training on applicable vessel guidelines.	Marine mammals, sea turtles, ESA-listed fish	BOEM and NMFS
BOEM PDCs/BMPs	Lessees and grantees shall take efforts to minimize disruption and disturbance to marine life from sound emissions, such as pile driving, during construction activities.	Marine mammals, sea turtles, ESA-listed fish	BOEM and NMFS
BOEM PDCs/BMPs	Lessees and grantees shall avoid and minimize impacts to marine species and habitats in the Project Area by posting a qualified observer on site during construction activities. These observers are approved by NMFS.	Marine mammals, sea turtles, ESA-listed fish	BOEM and NMFS
BOEM PDCs/BMPs	The applicant shall develop an Anchoring Plan to ensure anchoring is avoided and minimized in complex habitats during construction and O&M of the Project. This plan should delineate areas of complex habitat around each turbine and cable locations, and identify areas restricted from anchoring. The habitat maps and inshore maps delineating complex habitat adjacent to the O&M facility should be provided to all cable construction and support vessels to ensure no anchoring of vessels is done within or immediately adjacent to these complex habitats. The Anchoring Plan should be provided to USFWS prior to BOEM approval.	Benthic habitat, EFH, invertebrates, and finfish	BOEM and USFWS

H.2. Proposed Mitigation and Monitoring Measures Resulting from Consultations

Table H-2. Proposed Mitigation and Monitoring Measures Resulting from Consultations

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
Bird and Bat Mitigation Measures in the United States Fish and Wildlife Service (USFWS) Biological Assessment (BA)					
1	Pre-construction (Pre-C), construction (C), operation and maintenance (O&M)	Wind turbine generator (WTG) layout	Sunrise Wind LLC (Sunrise Wind) is committed to an indicative layout scenario with WTGs and the offshore converter station (OCS–DC) sited in a uniform east-west/north-south grid with 1.15-by-1.15-mile (mi; 1-by-1-nautical mile [nm]; 1.85-by-1.85-kilometer [km]) spacing that aligns with other proposed adjacent offshore wind projects in the Rhode Island--Massachusetts wind energy area (WEA) and Massachusetts WEA. This wide spacing of WTGs may reduce risk of barrier effects and/or displacement and may allow bats to avoid individual WTGs and minimize risk of potential collision. The WTGs will have an air gap from mean sea level to minimum blade swept height of 131.2 feet (ft; 40 meters [m]).	Birds and bats	Measure incorporated into Project design
2	Pre-C, C, O&M	Sunrise Wind Farm (SRWF) distance from shore	The offshore distance of the SRWF (greater than 15 mi [13 nm or 24.1 km]) avoids coastal and nearshore areas where bats typically occur.	Bats	Measure incorporated into Project design

[3] Enforcement by BOEM and BSEE will be conducted in accordance with Reorganization of Title 30 – Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf final rule, *88 Federal Register 6376*.

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
3	C, O&M	Lighting reduction measures	Construction and operational lighting in the offshore environment will be limited to the minimum necessary to ensure safety and compliance with applicable regulations. Lighting reduction measures could include downward projecting lights, lights triggered by motion sensors, and limiting lighting to that which is required for safety and compliance.	Multiple	BOEM, Bureau of Safety and Environmental Enforcement (BSEE), United States Coast Guard (USCG), and New York State Public Service Commission (NYSPSC)
4	O&M	ADLS or related dimming or shielding	Sunrise Wind will use an aircraft detection lighting system (ADLS) or related means (e.g., dimming or shielding) to limit visual impact, pursuant to approval by the Federal Aviation Administration (FAA) and Bureau of Energy Management (BOEM), commercial and technical feasibility at the time of the Facility Design Report (FDR) and/or Fabrication and Installation Report (FIR) approval, and dialogue with stakeholders.	Multiple	BOEM and BSEE
5	C	Mitigation for RTE species	Time-of-year restrictions for certain work activities, such as HDD conduit stringing, will be employed to the extent feasible to avoid or minimize direct impacts to rare, threatened, and endangered (RTE) avian species during construction of the Landfall.	Birds and bats	USFWS, NYSPSC, and BOEM
6	C	Mitigation for RTE species	Time-of-year restrictions for tree removal at the onshore facilities to avoid impacts to northern long-eared bats would also benefit breeding birds. If work is anticipated to occur outside of these time-of-year restriction periods, Sunrise Wind will consult with NYSDEC and USFWS, if applicable, regarding impacts to RTE avian species.	Birds and bats	USFWS, NYSPSC, and BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
7	C, O&M, decom-missioning (D)	Incidental mortality reporting	• Sunrise Wind 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 United States Geological Survey (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 turbine collision. While this Conservation Measure appropriately requires documentation and reporting of any fatalities observed incidental to O&M activities, the Avian & Bat Post-Construction Monitoring Plan 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 turbine unless there is evidence to support this conclusion. • Any occurrence of a dead Endangered Species Act (ESA)-listed bird or bat must be reported to BOEM, the 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.	Birds and bats	BOEM, BSEE, and USFWS
8	O&M	Collision risk model	BOEM has funded the development of a Stochastic Collision Risk Assessment for Movement (SCRAM), which builds on and improves earlier collision risk modeling frameworks. USFWS 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	Birds	BOEM, BSEE, and USFWS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			SCRAM. We expect that the current limitations of SCRAM will decrease substantially over time as more and more tracking data get 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. 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 sufficient funds to BOEM from Congress. This commitment will remain in effect until one of the following occurs: i. the SRWF turbines cease operation; ii. USFWS concurs that a robust weight of evidence has demonstrated that collision risks to listed birds from Sunrise Wind turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or iii. USFWS concurs that further development of SCRAM (or its successor) is unlikely to improve the accuracy or robustness of collision mortality estimates.		
9	O&M	Collision risk model utilization	BOEM will work cooperatively with USFWS to re-run the SCRAM model (or its successor) for the Sunrise Wind Project according to the following schedule: • At least annually for the first 3 years of WTG operation; • At least every other year for Years 4 to 10 of WTG operation (i.e., Years 4, 6, 8, and 10); • At least every 5 years between Year 10 and the termination of WTG operation (i.e., Years 15, 20, 25, and 30).	Birds	BOEM, BSEE, and USFWS

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			Between these regularly scheduled model runs, BOEM will also re-run the SCRAM and Band models (or its successor) within 90 days of each major model release or update, and at any time upon request by USFWS or Sunrise Wind, and at any time as desired by BOEM. The above schedule may be altered upon the mutual agreement of BOEM, BSEE, 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: i. The Sunrise Wind turbines cease operation; ii. USFWS concurs that a robust weight of evidence has demonstrated that collision risks to both listed birds from Sunrise Wind turbine operation are negligible (i.e., the risk of take from WTG operation is discountable); or iii. USFWS concurs that further model runs are unlikely to improve the accuracy or robustness of collision mortality estimates.		
10	Pre-O&M and O&M	Compensatory mitigation	To minimize population-level effects on listed birds, BOEM will require Sunrise Wind to provide appropriate compensatory mitigation as needed to offset projected levels of take of listed birds from WTG collision. Compensatory mitigation will be consistent with the conservation needs of listed species as identified in USFWS documents including, but not limited to, listing documents, Species Status Assessments, Recovery Plans, Recovery Implementation Strategies (RISs), and 5-Year Reviews. Compensatory mitigation will preferentially address priority actions, activities, or tasks identified in a Recovery Plan, RIS, or 5-Year Review, for piping plover and rufa red knot; however, research, monitoring, outreach, and other recovery efforts that do not materially offset birds lost to collision mortality will not be considered compensatory mitigation. Compensatory mitigation may include, but is not limited to: restoration or management of lands, waters, sediment, vegetation, or prey species to improve habitat quality or quantity for listed	Birds	BOEM, BSEE, and USFWS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			birds; efforts to facilitate habitat migration or otherwise adapt to sea level rise; predator management; management of human activities to reduce disturbance to listed birds; and efforts to curtail other sources of direct human-caused bird mortality such as from vehicles, collision with other structures (e.g., power lines, terrestrial wind turbines), hunting, oil spills, and harmful algal blooms. Geographic considerations may include, but are not limited to, (a) any listed species recovery unit(s) or other management unit(s) determined to be disproportionally affected by or vulnerable to collision mortality; and/or (b) those portions of a species' range where compensatory mitigation is most likely to be effective in offsetting collision mortality. Compensatory mitigation for the Sunrise Wind Project may be combined with mitigation associated with other offshore wind projects, but in no case will compensatory mitigation be double counted as applying to more than one offshore wind project. BOEM will require Sunrise Wind to prepare a Compensatory Mitigation Plan (CMP) prior to the start of WTG operation. At a minimum, the CMP will provide compensatory mitigation actions to offset projected levels of take of listed birds for the first 5 years of WTG operation at a ratio of 1:1. At its discretion, Sunrise Wind may include actions to offset projected take over a longer time period and/or at a higher ratio. The CMP will include: a. detailed description of one or more specific mitigation actions; b. the specific location for each action; c. a timeline for completion; d. itemized costs; e. a list of necessary permits, approvals, and permissions; f. details of the mitigation mechanism (e.g., mitigation agreement, applicant-proposed mitigation);		

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			g. best available science linking the compensatory mitigation action(s) to the projected level of collision mortality as described in this Opinion; h. a schedule for completion; and i. monitoring to ensure the effectiveness of the action(s) in offsetting the target level of take. CMP development and implementation will occur according to the following schedule: • At least 180 days before the start of WTG operation Sunrise Wind will distribute a draft CMP to BOEM, BSEE, USFWS, the New York State Department of Environmental Conservation (NYSDEC), and other identified stakeholders or interested parties for a 60-day review period. • At least 90 days before the start of WTG operation, Sunrise Wind will transmit a revised CMP for approval by BOEM, BSEE, and USFWS, along with a record of comments received on the draft. Sunrise Wind will rectify any outstanding agency comments or concerns before final approval by BOEM, BSEE, and USFWS. • Before or concurrent with the start of WTG operation, Sunrise Wind will provide documentation to BOEM, BSEE, and USFWS showing financial, legal, or other binding commitment(s) to CMP implementation. BOEM will require Sunrise Wind to prepare and implement a new CMP every 5 years for the life of the Project, according to a schedule developed by BOEM and approved by USFWS. Compensatory mitigation actions included in each new CMP will reflect: a. the level and effectiveness of mitigation previously provided by Sunrise Wind, to date; and b. the level of take over the next 5 years as projected by SCRAM (or its successor) (see D Collision Risk Model Utilization in the Biological Opinion).		

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11	C, O&M	Collision mitigation coordination	1. **Mitigation Assessments:** At least annually, and as detailed below, BOEM, BSEE, USFWS, and Sunrise Wind will work together to assess the minimization of, and compensatory mitigation for, collisions of listed birds with the Sunrise Wind turbines. The NYSDEC will also be invited to participate in these mitigation assessments. The first mitigation assessment will occur during the Sunrise Wind Project construction phase, prior to the start of WTG operation. Subsequent mitigation assessments will be held concurrent with or shortly after the annual monitoring data review. Additional mitigation assessments (addressing minimization and/or compensatory mitigation) may be carried out at any time upon request by BOEM, BSEE, USFWS, the NYSDEC, or Sunrise Wind based on substantive new information or changed circumstances. These periodic mitigation assessments for the SRWF may eventually be integrated into a regional or coastwide adaptive monitoring and impact minimization framework. 2. **Minimization:** BOEM will work with USFWS, the NYSDEC, and Sunrise Wind to annually review the best available information regarding technologies and methods for minimizing collision risk to listed species, including but not limited to: WTG coloration/marking, lighting, avian deterrents, and limited WTG operational changes. BOEM will require Sunrise Wind to adopt and deploy such minimization technologies/methods as deemed reasonable and prudent. Operational changes may include, but are not limited to, feathering, which involves adjusting the angle of the blades to slow or stop them from turning under certain conditions. BOEM will specify the timeframe in which any required minimization measure(s) must be implemented, as well as any requirements to monitor, maintain, or adapt the measure(s) over time.	Birds	BOEM, BSEE, and USFWS
12	Pre-C, C. O&M	Mitigation for RTE species	**Collision Minimization Report** 1. Prior to the start of WTG operations at SRWF, BOEM must extract from existing Project documentation (e.g., the BA, other consultation documents,	birds	USFWS, BSEE, and BOEM

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			the Final Environmental Impact Statement [EIS], the Construction and Operations Plan [COP]) a stand-alone summary of technologies and methods that were evaluated by BOEM to reduce or minimize bird collisions at the SRWF WTGs. 2. 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. 3. BOEM must distribute a draft Collision Minimization Report to USFWS, Sunrise Wind, and NYSDEC for a 60-day review period. BOEM must address all comments received during the review period and issue the final report within 60 days of the close of the review period. 4. Following issuance of the final Collision Minimization Report, USFWS may call for a meeting. Within 60 days following a call for such a meeting, BOEM must convene a meeting with USFWS and Sunrise Wind. Meeting participants will discuss the report and seek consensus on whether implementation of any technologies/methods is warranted.		
13	Pre-C, C. O&M	Mitigation for RTE species	Notification of injured or dead listed species will be made to USFWS Law Enforcement and Long Island Field Office. Exercise care in handling any specimens to preserve biological material in the best possible state. Upon locating a dead piping plover, rufa red knot, or other listed species, initial notification must be made to the following USFWS offices: Resident Agent in Charge U.S. Fish and Wildlife Service Office of Law Enforcement	Birds and bats	USFWS, BSEE, and BOEM

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			70 East Sunrise Highway, Ste. 419 Valley Stream, New York 11581 516-825-3950 and U.S. Fish and Wildlife Service Long Island Field Office 340 Smith Road Shirley, New York 11967 (631) 286-0485		
14	C	Mitigation for surficial ground disturbance	The use of horizontal directional drilling (HDD) or other trenchless technologies for installation of the export cable landfalls to avoid surficial disturbances.	Multiple	Measure incorporated into Project design
15	C	Revegetation	Temporarily disturbed areas will be revegetated with appropriate native species as appropriate.	Multiple	BSEE, Environmental Protection Agency (EPA), and NYSPSC
16	C, O&M	Invasive species management	An Invasive Species Control and Management Plan will be implemented to manage the spread of invasive plant and aquatic species.	Multiple	BOEM, BSEE, and NYSPSC
17	Pre-C, C	Mitigation for bird and bat collisions	The onshore transmission cable and onshore interconnection cable will not include any overhead utility poles, thus minimizing potential impacts to birds and bats associated with collision with overhead lines.	Multiple	Measure incorporated into Project design

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18	C, O&M, D	Mitigation of accidental spills or release	Accidental spill or release of oils or other hazardous materials will be managed offshore through an Emergency Response Plan/Oil Spill Response Plan (ERP/OSRP) and onshore through a Spill Prevention, Control, and Countermeasure (SPCC) Plan. The SPCC Plan will also include the planning process (Minimum Requirements Analysis) for areas within and adjacent to federally designated wilderness and National Parks Service (NPS) land within Fire Island National Seashore.	Multiple	BSEE, USCG, EPA, and NYSPSC
Reasonable and Prudent Measures from the National Marine Fisheries Service Biological Opinion Issued September 28, 2023					
1	C	Minimize pile driving impacts	Effects to ESA-listed species must be minimized during pile driving.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS, BSEE, & BOEM
2	C	Minimize unexploded ordinances/ munitions of explosive concern (UXO/MEC) detonation impacts	Effects to ESA-listed species must be minimized during UXO/MEC detonations.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS Office of Protected Resources (OPR), BSEE, United States Army Corps of Engineers (USACE), & BOEM
3	C, O&M, D	Minimize vessel impacts	Vessels operated by Sunrise Wind or under contract to Sunrise Wind or its contractors must comply with the reasonable and prudent measures (RPMs) and terms and conditions (T&Cs) relevant to vessel operations within the Delaware River and Delaware Bay included in the Incidental Take Statements	Marine mammals, sea turtles, Atlantic	NMFS OPR, BSEE, USACE, & BOEM

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			(ITS) provided with National Marine Fisheries Service (NMFS) Greater Atlantic Regional Fisheries Office (GARFO)'s July 19, 2022, Paulsboro Marine Terminal Biological Opinion or any subsequently issued Opinion that replaces that Opinion as a result of reinitiation.	sturgeon and shortnose sturgeon	
4	C, O&M, D	Reporting requirements	Effects to, or interactions with, ESA-listed Atlantic sturgeon, whales, and sea turtles must be properly documented during all phases of the Proposed Action, and all incidental take must be reported to NMFS GARFO.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
5	C, O&M, D	Monitoring plans	Plans must be prepared that describe the implementation of activities or monitoring protocols for which the details were not available at the time this consultation was completed. All required plans must be submitted to NMFS GARFO with sufficient time for review, comment, and concurrence.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
6	C, O&M, D	Agency authority	BOEM, BSEE, NMFS OPR, and USACE must exercise their authorities to assess and ensure compliance with the implementation of measures to avoid, minimize, and monitor, and report incidental take of ESA-listed species during activities described in this Opinion. On-site observation and inspection must be allowed to gather information on the implementation of measures, and the effectiveness of those measures, to minimize and monitor incidental take during activities described in this Opinion, including its ITS.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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Terms and Conditions from the NMFS Biological Opinion Issued September 28, 2023					
1	C, O&M, D	RPM 1 & 2	To implement the requirements of RPM 1 and 2 for ESA-listed whales, Sunrise Wind must comply with the measures specified in the proposed Incidental Take Authorization (ITA) (which are incorporated into the Proposed Action) as modified or supplemented in the final Marine Mammals Protection Act (MMPA) ITA, to minimize effects of pile driving and UXO/MEC detonation on ESA-listed whales. To facilitate implementation of this requirement: a. BOEM must require, through an enforceable condition of their approval of Sunrise Wind's COP, that Sunrise Wind 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. 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 Sunrise Wind over the life of the MMPA ITA and taking any responsive action within its statutory and regulatory authority it deems necessary to ensure compliance based on the foregoing review. 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 Sunrise Wind 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.	ESA-listed whales	NMFS OPR, BSEE, USACE, & BOEM

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2	C	RPM 1	To implement the requirements of RPM 1, the following measures related to sound field verification (SFV) for WTG and OCS–DC foundation installation must be implemented by BOEM, BSEE, USACE, and/or Sunrise Wind. The purpose of SFV and the steps outlined here are to ensure that Sunrise Wind does not exceed the distances to the injury or behavioral harassment threshold (Level A and Level B harassment, respectively) for ESA-listed marine mammals, the injury or behavioral harassment thresholds for sea turtles, or the injury or behavioral disturbance thresholds for Atlantic sturgeon that are identified in this Opinion and that underpin the effects analysis, exposure analysis and our determination of the amount and extent of incidental take exempted in this ITS, including any determination that no incidental take is anticipated (i.e., for Atlantic sturgeon). The measures outlined here are based on the expectation that Sunrise'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 decibel [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. a. Consistent with the measures incorporated into the Proposed Action, BOEM, BSEE, and USACE must require, and Sunrise Wind must implement, SFV on at least the first three monopiles installed (see also T&C 11.d. below) in accordance with the additional requirements specified here. 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., 7.1.10, 7.1.19, 7.1.34, 7.1.35, 7.1.45), before the next pile is installed Sunrise Wind must implement the following measures as applicable:	Sea turtles and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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			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 2 business days after receiving Sunrise Wind's proposal and request for concurrence. ii. If any of the SFV measurements indicate that the distances to level A thresholds for ESA-listed whales (peak or cumulative) or permanent threshold shift (PTS) peak or cumulative thresholds for sea turtles are greater than the modeled distances (assuming 10 dB attenuation, see Tables 7.1.8., 7.1.10, 7.1.19, 7.1.34, 7.1.35, 7.1.45), 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 m that a marine mammal clearance or shutdown zone is		

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			expanded, additional protected species observers (PSOs) must be deployed from additional platforms/vessels to ensure adequate and complete monitoring of the expanded shutdown and/or clearance zone; Sunrise Wind 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. 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., 7.1.10, 7.1.19, 7.1.34, 7.1.35, 7.1.45), Sunrise Wind 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 2 business days after receiving Sunrise Wind's proposal and request for concurrence. Clearance and shutdown zones must be expanded consistent with the requirements of 2.b.ii.		

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			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, Sunrise Wind 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 Sunrise Wind 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 Sunrise Wind 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). 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 3 business days to discuss: the results of SFV monitoring, the severity of exceedance of distances to identified isopleths of concern, the species affected,		

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			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. 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., 7.1.10, 7.1.19, 7.1.34, 7.1.35, 7.1.45), 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 Sunrise Wind must continue to implement the approved additional, alternative, or modified sound attenuation measures/operational changes: BOEM, BSEE, USACE and/or Sunrise Wind can request concurrence from NMFS GARFO to the original clearance and shutdown zones (Table 11.1) or Sunrise Wind can continue with the expanded clearance and shutdown zones with additional PSOs. b. Consistent with the measures incorporated into the Proposed Action, BOEM, BSEE, and USACE must require, and Sunrise Wind must implement SFV on all pin piles associated with installation of the OCS–DC foundation with the additional requirements specified here (see also T&C 5.d. below). As only a single OCS–DC foundation is proposed, there are no provisions for adjustments to the noise attenuation system for subsequent installations. c. Abbreviated SFV monitoring (consisting of a single acoustic recorder placed at an appropriate distance from the pile) must be performed on all		

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			foundation installations for which the complete SFV monitoring outlined in 2a and 2b is not carried out. Results must be included in the weekly reports. Any indications 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 must be addressed by Sunrise Wind, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles. BOEM, BSEE, USACE, and Sunrise Wind must meet with NMFS GARFO within 2 business days of Sunrise Wind's submission of a report that includes an exceedance to discuss if any additional action is necessary. d. Sunrise Wind must inspect and carry out appropriate maintenance on the noise attenuation system prior to every pile driving event and prepare and submit a noise attenuation system (NAS) inspection/performance report. For piles for which full 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. 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		

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			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.		
3	C	RPM 2	To implement the requirements of RPM 2, the following measures must be implemented by Sunrise Wind: a. Establish a clearance zone for sea turtles extending 500 m (1,640 ft) around any planned UXO/MEC detonations. Maintain the clearance zone for at least 60 minutes prior to any UXO/MEC detonation. This requirement expands the size of the clearance zone identified by BOEM as part of the Proposed Action. Sunrise Wind must ensure that there is sufficient PSO coverage to reliably document sea turtle presence within the clearance zone as described in the Marine Mammal and Sea Turtle Monitoring Plan. In the event that a PSO detects a sea turtle inside the 500 m (1,640 ft) clearance zone, detonation will be delayed until the sea turtle has not been observed for 30 minutes or has been observed to leaving the clearance zone. b. Provide NMFS GARFO with notification of planned UXO/MEC detonation as soon as possible but at least 48 hours prior to the planned detonation, unless this 48-hour notification would create delays to the detonation that would result in imminent risk of human life or safety. This notification must include the coordinates of the planned detonation, the estimated charge size, and any other information available on the characteristics of the	Marine mammals and sea turtles	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			UXO/MEC. NMFS GARFO will provide alerts to NMFS sea turtle and marine mammal stranding network partners consistent with best practices. Notification must be provided via email to nmfs.gar.incidental-take@noaa.gov and by phone to the NMFS GARFO Protected Resources Division (978-281-9328).		
4	C	RPM 2	To implement the requirements of RPM 2, the following measures related to sound field verification (SFV) for UXO/MEC detonation must be implemented by BOEM, BSEE, USACE, and/or Sunrise Wind. The purpose of SFV and the steps outlined here are to ensure that Sunrise Wind does not exceed the distances to the injury or behavioral harassment threshold (Level A and Level B harassment respectively) for ESA-listed marine mammals, the injury or behavioral harassment thresholds for sea turtles, or the injury or behavioral disturbance thresholds for Atlantic sturgeon that are identified in this Opinion and that underpin the effects analysis, exposure analysis and our determination of the amount and extent of incidental take exempted in this ITS, including the determination that no incidental take is anticipated. The measures outlined here are based on the expectation that Sunrise Wind's initial UXO/MEC detonation 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 planned detonation. The steps outlined here reflect the Proposed Action which considers a total of no more than three detonations. a. Consistent with the measures incorporated into the Proposed Action, BOEM, BSEE, and USACE must require, and Sunrise Wind must implement SFV for all UXO/MEC detonations (see also T&C 8.d. below) in accordance with the additional requirements specified here. If any of the SFV	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			measurements from any detonation indicate that the distance to any isopleth of concern is greater than those modeled assuming 10 dB attenuation (see Tables 7.1.27, 7.1.40, 7.1.47), for the next detonation Sunrise Wind must implement the following measures as applicable: 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 UXO/MEC was detonated with a single bubble curtain, add a second bubble curtain; adjust NAS 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 for any subsequent detonation (e.g., if threshold distances are exceeded for detonation 1, then additional measures must be deployed for detonation 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 2 business days after receiving Sunrise Wind's proposal and request for concurrence. 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 7.1.27, 7.1.40, 7.1.47), the clearance and shutdown zones (see Table 11.1) for subsequent detonations 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 for detonation 1 then the		

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			clearance and shutdown zones for detonation 2 must be expanded). For every 1,500 m 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; Sunrise Wind 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 75 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. 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 7.1.27, 7.1.40, 7.1.47), Sunrise Wind 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 detonation (e.g., if threshold distances are exceeded on detonation 2 then additional measures must be deployed for detonation 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		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			later than 2 business days after receiving Sunrise Wind's proposal and request for concurrence. Clearance and shutdown zones must be expanded consistent with the requirements of 2.b.ii. iv. If no additional measures or modifications are identified for implementation for UXO detonation 2 or 3, NMFS GARFO, NMFS OPR, BOEM, BSEE, and USACE will meet within 3 business days to discuss: the results of SFV monitoring, the severity of exceedance of distances to identified isopleths of concern, the species affected, modeling assumptions, and whether 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. b. Sunrise Wind must inspect and carry out appropriate maintenance on the noise attenuation system prior to every UXO/MEC detonation event and prepare and submit a noise attenuation system (NAS) inspection/performance report. This report must be submitted as soon as it is available, but no later than when the interim SFV report is submitted for the detonation. 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. i. Performance reports for each bubble curtain deployed must include water depth (m), current speed (m/s) and direction (degrees), wind speed (m/s) and direction (degrees), Beaufort sea state, bubble curtain deployment/retrieval date and time (UTC), bubble curtain hose length (m), bubble curtain radius (distance from pile) (m), diameter of holes and hole spacing (metric units), air supply hose length (m), compressor type (including rated Cubic Feet per Minute (CFM) and model number), number of operational compressors,		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			performance data from each compressor (including Revolutions Per Minute (RPM), pressure, start and stop times [UTC]), free air delivery (m^3/min), total hose air volume (m^3/(min m)), schematic of GPS waypoints during hose laying, maintenance procedures performed and results (pressure tests, inspections, flushing, re-drilling, and any other hose or system maintenance) before and after installation and start and stop times of those tests (UTC), and the length of time the bubble curtain was on the seafloor prior to the associated foundation installation, and confirmation that the bubble curtain was in full contact with the seafloor throughout the use. 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, corrective measures conducted to ensure the system is working sufficiently. The report may also include any relevant video and/or photographs of the bubble curtain(s) operating during all pile driving.		
5	C, O&M, D	RPM 3	To implement the requirements of RPM 3, the following conditions must be implemented: a. BOEM, BSEE, and/or USACE must require that Sunrise Wind document and report the number of vessel calls to the Paulsboro Marine Terminal. This must be included in the monthly Project reports submitted to NMFS GARFO over the life of the Project (see T&C 6.g. below). b. BOEM, BSEE, and/or USACE must ensure that Sunrise Wind is aware of and complies with, and Sunrise Wind must comply with, the T&C of the July 19, 2022 Paulsboro Biological Opinion and ITS and any subsequent Opinion or amended ITS that results from reinitiation of the 2022 Opinion. For ease of reference those measures are included here:	Marine mammals, sea turtles, Atlantic sturgeon, and Shortnose sturgeon	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			i. No later than March 1 of each year, report the number of vessel port calls to the Paulsboro Marine Terminal in the previous year by month. This report must also include the type of vessel and its draft. Reports must be filed with the USACE Philadelphia District (NAPRegulatory@usace.army.mil) and NMFS GARFO (nmfs.gar.incidental-take@noaa.gov). (Reference: RPM 1, T&C 1 of the 2022 Paulsboro Biological Opinion). ii. Report any sturgeon observed with injuries or mortalities in the Paulsboro Marine Terminal Area to NMFS within 24 hours using the form available at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null. Submit forms to nmfs.gar.incidental-take@noaa.gov within 24 hours. (Reference: RPM 2, T&C 2 of the 2022 Paulsboro Biological Opinion). c. Hold any dead sturgeon in cold storage until proper disposal procedures are discussed with NMFS GARFO. (Reference: RPM 3, T&C 5 of the 2022 Paulsboro Biological Opinion). d. Complete procedures for genetic sampling of any dead Atlantic sturgeon that are over 75 cm. (Reference RPM 4, T&C 6 of the 2022 Paulsboro Biological Opinion). More information on submitting genetic samples is included in T&C 6a below; these instructions are consistent with the requirements of the 2022 Paulsboro Opinion.		
6	C	RPM 4	To implement the requirements of RPM 4, Sunrise Wind 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	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			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 shutting down. If shutdown was determined not to be feasible, the report must include an explanation for that determination and the measures that were implemented (e.g., reduced hammer energy).		
7	C, O&M, D	RPM 4	To implement the requirements of RPM 4, BOEM, BSEE, USACE, and Sunrise Wind 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: 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 Sunrise Wind 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 to document the distinct population segment (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-	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic, under the "Sturgeon Genetics Sampling" heading. b. If a North Atlantic right whale (NARW) is observed at any time by PSOs or Project personnel, Sunrise Wind 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. i. The report must be made to the appropriate geographic reporting line: ● If in the Northeast Region (from Maine to Virginia/North Carolina border) call (866-755-6622). ● If in the Southeast Region (North Carolina to Florida) call (877-WHALE-HELP or 877-942-5343). ● If 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/). 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. ii. If a NARW is detected at any time by PSOs/PAM operators via PAM, Sunrise Wind 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 NARW Detection Template (https://www.fisheries.noaa.gov/resource/document/passive-		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			acoustic-reporting-system-templates). Calling the hotline is not necessary when reporting PAM detections via the template. 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-Northeast Fisheries Science Center (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, high-resolution geophysical [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. c. In the event of a suspected or confirmed vessel strike of any ESA-listed species (e.g. marine mammal, sea turtle, listed fish) by any vessel associated with the Project or other means by which Project activities caused a non-auditory injury or death of a ESA-listed species, Sunrise Wind must immediately report the incident to NMFS. If in the Greater Atlantic Region (from Maine to Virginia), 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 (protected species@bsee.gov) Separately, Sunrise Wind must immediately report the incident to NMFS GARFO (mailto: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		

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			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.		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			d. In the event that personnel involved in the Project discover a stranded, entangled, injured, or dead ESA-listed species (e.g. marine mammal, sea turtle, listed fish), the Sunrise Wind must immediately report the observation 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). Separately, Sunrise Wind must report the incident, if in the Greater Atlantic Region (ME to VA) to GARFO (nmfs.gar.incidental-take@noaa.gov) or if in the Southeast Region (NC-FL) to NMFS SERO (secmammalreports@noaa.gov) as soon as feasible. As well as notify BSEE (via TIMSWeb and notification email to (protectedspecies@bsee.gov). Note, the NOAA Stranding Hotline may request the report be sent to the local stranding network response team. Reports of listed fish should only be sent to nmfs.gar.incidental-take@noaa.gov. The report must include: (A) Contact information (name, phone number, etc.), time, date, and location (coordinates) of the first discovery (and updated location information if known and applicable); (B) Species identification (if known) or description of the animal(s) involved; (C) Condition of the animal(s) (including carcass condition if the animal is dead); (D) Observed behaviors of the animal(s), if alive; (E) If available, photographs or video footage of the animal(s); and (F) General circumstances under which the animal was discovered. Staff responding to the hotline call will provide any instructions for handling or disposing of any injured or dead animals, which may include coordination of transport to shore, particularly for injured sea turtles. e. Sunrise Wind must compile and submit weekly reports during each month that foundation pile driving occurs that document the pile ID, type of pile, pile diameter, start and finish time of each pile driving event, hammer log (number of strikes, max hammer energy, duration of piling) per pile, any		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			changes to noise attenuation systems and/or hammer schedule, details on the deployment of PSOs and PAM operators, including the start and stop time of associated observation periods by the PSOs and PAM operators, and a record of all observations/detections of marine mammals and sea turtles including time (UTC) of sighting/detection, species ID, behavior, distance (meters) from vessel to animal at time of sighting/detection (meters), animal distance (meters) from pile installation vessel, vessel/project activity at time of sighting/detection, platform/vessel name, and mitigation measures taken (if any) and reason. Sightings/detections during pile driving activities (clearance, active pile driving, post-pile driving) and all other (transit, opportunistic, etc.) sightings/detection must be reported and identified as such. These weekly reports must be submitted to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov), BOEM, and BSEE by Sunrise Wind or the PSO providers and can consist of QA/QC'd raw data. Weekly reports are due on Wednesday for the activities occurring the previous week (Sunday – Saturday, local time). f. Starting in the first month that in-water activities occur (e.g., cable installation, fisheries surveys), Sunrise Wind must compile and submit monthly reports that include a summary of all Project activities carried out in the previous month, including dates and location of any fisheries surveys carried out, vessel transits (name, type of vessel, number of transits, vessel activity, and route (origin and destination) (this includes transits from all ports, foreign and domestic)), cable installation activities (including sea to shore transition), number of piles installed and pile IDs, and all sightings/detections of ESA-listed whales, sea turtles, and sturgeon, inclusive of any mitigation measures taken as a result of those observations. Sightings/detections must include species ID, time, date, initial detection distance, vessel/platform name, vessel activity, vessel		

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			speed, bearing to animal, project activity, and if any mitigation measures taken. These reports must be submitted to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) and are due on the 15th of the month for the previous month. g. Sunrise Wind must submit to NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) an annual report describing all activities carried out to implement their Fisheries Research and Monitoring Plan. This report must include a summary of all activities conducted, the dates and locations of all fisheries surveys, including location and duration for all trawl surveys summarized by month, number of vessel transits inclusive of port of origin and destination, and a summary table of any observations and captures of ESA-listed species during these surveys. The report must also summarize all acoustic telemetry and benthic monitoring activities that occurred, inclusive of vessel transits. Each annual report is due by February 15 (i.e., the report for 2024 activities is due by February 15, 2025). h. BOEM, BSEE, and/or Sunrise Wind must submit full detection data, metadata, and location of recorders (or GPS tracks, if applicable) from all real-time hydrophones used for monitoring during construction within 90 calendar days after pile-driving has ended. Reporting must use the webform templates on the NMFS Passive Acoustic Reporting System website at https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates. BOEM, BSEE, and/or Sunrise Wind must submit the full acoustic recordings from all the real-time hydrophones to the National Centers for Environmental Information for archiving within 90 calendar days after pile-driving has ended and instruments have been pulled from the water. Archiving guidelines outlined here (https://www.ncei.noaa.gov/products/passive-acoustic-data#tab-3561)		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			must be followed. Confirmation of both submittals must be sent to NMFS GARFO.		
8	O&M	RPM 4	To implement the requirements of RPM 4 and to facilitate monitoring of the incidental take exemption for sea turtles, BOEM, BSEE, USACE, and NMFS must meet twice annually to review sea turtle observation records. These meetings/conference calls will be held in September (to review observations through August of that year) and December (to review observations from September to November) and will use the best available information on sea turtle presence, distribution, and abundance, 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.	Sea Turtles	NMFS OPR, BSEE, USACE, & BOEM
9	C	RPM 4	To implement the requirements of RPM 4, within 10 business days of BOEM, BSEE, and/or USACE obtaining updated information on Project plans (i.e., as obtained through a relevant Facility Design Report (FDR) and/or Fabrication and Installation Report (FIR), or other submission), BOEM, BSEE, and/or USACE must provide NMFS GARFO (nmfs.gar.incidental-take@noaa.gov) with the following information: number and size of foundations to be installed to support WTGs and offshore substations, installation method for the sea to shore transition (e.g., casing pipe, cofferdam, no containment), the proposed construction schedule (i.e., months when pile driving is planned), and any available updates on anticipated vessel transit routes (e.g., any changes to the ports identified for use by Project vessels) that will be used by Project vessels . NMFS GARFO will review this information and request a meeting with BOEM, BSEE, and USACE if there is any indication that there are changes to the Proposed Action that would cause an effect to listed species or critical habitat that was not considered in this Opinion, including the amount or extent of predicted take, such that any potential trigger for reinitiation of consultation can be discussed with the relevant action agencies.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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10	O&M	RPM 4	To implement RPM 4 for trawl surveys: a. At least one of the survey staff onboard the trawl survey vessels must have completed NMFS Northeast Fisheries Observer Program (NEFOP) training within the last 5 years or other training in protected species identification and safe handling (inclusive of taking genetic samples from Atlantic sturgeon); documentation of training must be submitted to NMFS GARFO at least 7 calendar days prior to the start of the trawl surveys and at any later time that a different NEFOP trained observer is deployed on the survey. b. If Sunrise Wind will deploy non-NEFOP trained survey personnel in lieu of NEFOP-trained observers, BOEM, BSEE, and/or Sunrise Wind must submit a plan to NMFS describing the training that will be provided to those survey observers. This Observer Training Plan for Trawl Surveys must be submitted as soon as possible after issuance of this Opinion but no later than 15 calendar days prior to the start of trawl surveys for which a non-NEFOP trained observer will be deployed. BOEM, BSEE, and Sunrise Wind must obtain NMFS GARFO's concurrence with this plan prior to the start of any such trawl surveys. This plan must include a description of the elements of the training (i.e., curriculum, virtual or hands on, etc.) and identify who will carry out the training and their qualifications. Once the training is complete, confirmation of the training and a list of trained survey staff must be submitted to NMFS; this list must be updated if additional staff are trained for future surveys. In all cases, a list of trained survey staff must be submitted to NMFS at least one business day prior to the beginning of the survey.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
11	C	RPM 5	To implement RPM 5, the plans identified below must be submitted to NMFS GARFO at nmfs.gar.incidental-take@noaa.govby BOEM, BSEE, and/or Sunrise Wind. Any of the identified plans can be combined such that a single submitted	Marine mammals, sea turtles,	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			plan addresses multiple requirements provided that the plan clearly identifies which requirements it is addressing. For each plan, within 45 calendar days of receipt of the plan, NMFS GARFO will provide comments to BOEM, BSEE, and Sunrise Wind, including a determination as to whether the plan is consistent with the requirements outlined in this ITS and/or in Section 3 of this Opinion. If the plan is determined to be inconsistent with these requirements, BOEM, BSEE and/or Sunrise Wind must resubmit a modified plan that addresses the identified issues within 30 days of the receipt of the comments but at least 15 calendar days before the start of the associated activity; at that time, BOEM, BSEE and NMFS GARFO and OPR will discuss a timeline for review and approval of the modified plan. If further revisions are necessary, at all times, NMFS GARFO, BOEM, and BSEE will be provided at least 3 business days for review and whenever possible, NMFS GARFO, BOEM, and BSEE will aim to provide responses within 4 business days. BOEM, BSEE and Sunrise Wind must receive NMFS GARFO's concurrence with these plans before the identified activity is carried out: a. **Passive Acoustic Monitoring Plan for Pile Driving**. BOEM, BSEE, and/or Sunrise Wind must submit this plan to NMFS GARFO at least 180 calendar days before impact pile driving is planned. BOEM, BSEE, and Sunrise Wind must obtain NMFS GARFO's concurrence with the PAM Plan prior to the start of any pile driving. The plan must include a description of all proposed PAM equipment and hardware, the calibration data, bandwidth capability and sensitivity of hydrophones, and address how the proposed PAM will follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind (Van Parijs et al., 2021). The PAM Plan must describe and include all procedures, documentation, and protocols including information (i.e., testing, reports, equipment specifications) to support that it will be able to detect vocalizing whales within the clearance and shutdown zones, including	and Atlantic sturgeon	

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			deployment locations, procedures, detection review methodology, and protocols; hydrophone detection ranges with and without foundation installation activities and data supporting those ranges; communication time between call and detection, and data transmission rates between PAM Operator and PSOs on the pile driving vessel; where PAM operators will be stationed relative to hydrophones and PSOs on pile driving vessel calling for delay/shutdowns; and a full description of all proposed software, call detectors, and filters. The PAM Plan must also incorporate the requirements relative to NARW reporting in 6.b. b. **Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving**. BOEM, BSEE, and/or Sunrise Wind must submit this plan to NMFS GARFO at least 180 calendar days before any pile driving for foundation installation is planned. BOEM, BSEE, and/or Sunrise Wind must obtain NMFS GARFO's concurrence with this plan(s) prior to the start of any pile driving for foundation installation. The plan(s) must include: a description of how all relevant mitigation and monitoring requirements contained in the ITS will be implemented, a pile driving installation summary and sequence of events, a description of all training protocols for all Project personnel (PSOs, PAM operators, trained crew lookouts, etc.), a description of all monitoring equipment and evidence (i.e., manufacturer's specifications, reports, testing) that it can be used to effectively monitor and detect ESA-listed marine mammals and sea turtles in the identified clearance and shutdown zones (i.e., field data demonstrating reliable and consistent ability to detect ESA-listed large whales and sea turtles at the relevant distances in the conditions planned for use), communications and reporting details, and PSO monitoring and mitigation protocols (including number and location of PSOs) for effective observation and documentation of sea turtles and ESA-listed marine mammals during all pile driving events. The plan(s) must demonstrate sufficient PSO and PAM		

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			Operator staffing (in accordance with watch shifts), PSO and PAM Operator schedules, and contingency plans for instances if additional PSOs and PAM operators are required. The plan must detail all plans and procedures for sound attenuation, including procedures for adjusting the NAS(s) and available contingency noise attenuation measures/systems if distances to modeled isopleths of concern are exceeded during SFV. The plan must also describe how Sunrise Wind will determine the number of sea turtles exposed to noise above the 175 dB harassment threshold during impact pile driving of WTG and OCS–DC foundations and how Sunrise Wind will determine the number of ESA-listed whales exposed to noise above the Level B harassment threshold during impact pile driving of WTG and OCS–DC foundations. c. **Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan**. BOEM, BSEE, and/or Sunrise Wind must submit this plan or plans (if separate Daytime Reduced Visibility and Nighttime Monitoring Plans are prepared) to NMFS GARFO at least 180 calendar days before impact pile driving is planned to begin. BOEM, BSEE, and Sunrise Wind must obtain NMFS GARFO's concurrence with this plan(s) prior to the start of pile driving. This plan(s) must contain a thorough description of how Sunrise Wind will monitor pile driving activities during reduced visibility conditions (e.g. rain, fog) and at night, including proof of the efficacy of monitoring devices (e.g., mounted thermal/infrared camera systems, handheld or wearable night vision devices [NVDs], spotlights) in detecting ESA-listed marine mammals and sea turtles over the full extent of the required clearance and shutdown zones, including demonstration that the full extent of the minimum visibility zones (1,500 m) can be effectively and reliably monitored. The plan must identify the efficacy of the technology at detecting marine mammals and sea turtles in the clearance and shutdown zones under all the various conditions anticipated during construction,		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			including varying weather conditions, sea states, and in consideration of the use of artificial lighting. If the plan does not include a full description of the proposed technology, monitoring methodology, and data demonstrating to NMFS GARFO's satisfaction that marine mammals and sea turtles can reliably and effectively be detected within the clearance and shutdown zones for monopiles before and during impact pile driving, nighttime pile driving (unless a pile was initiated 1.5 hours prior to civil sunset) may not occur. Additionally, this plan must contain a thorough description of how Sunrise Wind will monitor pile driving activities during daytime when unexpected changes to lighting or weather occur during pile driving that prevent visual monitoring of the full extent of the clearance and shutdown zones. d. **SFV Plan - WTG and OCS–DC Installation**. BOEM, BSEE, and/or Sunrise Wind must submit this plan to NMFS GARFO at least 180 calendar days before pile driving for WTG and/or OCS–DC foundations is planned to begin. BOEM, BSEE, and Sunrise Wind must obtain NMFS GARFO's concurrence with this plan(s) prior to the start of these pile driving activities. To validate the estimated sound field, SFV measurements will be conducted during pile driving of the first three monopiles installed over the course of the Project, with noise attenuation activated. SFV measurements will also be conducted during pile driving of the first full pin pile foundation. The plan(s) must describe how the first three monopile installation sites and installation scenarios (i.e., hammer energy, number of strikes, total hammer energy) are representative of the rest of the monopile installations and, therefore, why these monopile installations would be representative of the remaining monopile installations. If the monitored pile locations are different from the ones used for exposure modeling, justification must be provided for why these locations are representative of the modeling. In the case that these sites are not		

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			determined to be representative of all other monopile installation sites, Sunrise Wind must include information on how additional monopiles/sites would be selected for SFV. The plan(s) must also include the piling schedule and sequence of events, communication and reporting protocols, methodology for collecting, analyzing, and preparing SFV data for submission to NMFS GARFO including instrument deployment, locations of all hydrophones including direction and distance from the pile, hydrophone sensitivity, recorder/measurement layout, and analysis methods, and a template of the interim report to be submitted. The plan must also identify the number and location of hydrophones that will be reported in the SFV Interim Reports and any additional hydrophone locations that will be included in the final report(s). The plan must describe how the effectiveness of the sound attenuation methodology would be evaluated based on the results. The plan must address how Sunrise Wind will implement T&C 2a and 2b (see above) which includes, but is not limited to identifying additional noise attenuation measures (e.g., add noise attenuation device, adjust hammer operations, adjust noise monitoring system) that will be applied to reduce sound levels if measured distances are greater than those modeled. The plan must describe how abbreviated SFV monitoring (consisting of a single acoustic recorder placed at an appropriate distance from the pile) required by T&C 2c will be performed on all foundation installations for which the complete SFV monitoring outlined in 2a and 2b is not carried out. The plan must also outline the anticipated results that will be included in the weekly reports. The plan must also specify steps that will be taken should any exceedances occur. i. SFV Interim Reports - Pile Driving. BOEM, BSEE, and USACE must require and Sunrise Wind must provide, as soon as they are available but no later than 48 hours after the installation of each of the first three		

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			monopiles and after the installation of the first full pin pile foundation, the initial results of the SFV measurements to NMFS GARFO in an interim report. If technical or other issues prevent submission within 48 hours, Sunrise Wind must notify BOEM, BSEE, and NMFS GARFO within that 48-hour period with the reasons for delay and provide an anticipated schedule for submission of the report. These reports are required for each of the first three monopiles installed, the pin pile OCS–DC foundation, and any additional piles for which SFV is required. The interim report must include data from hydrophones identified for interim reporting in the SFV Plan and include a summary of pile installation activities (pile diameter, pile weight, pile length, water depth, sediment type, hammer type, total strikes, total installation time [start time, end time], duration of pile driving, max single strike energy, NAS deployments), pile location, recorder locations, modeled and measured distances to thresholds, received levels (rms, peak, and SEL) results from conductivity, temperature, and depth casts/sound velocity profiles, signal and kurtosis rise times, pile driving plots, activity logs, weather conditions. Additionally, any important sound attenuation device malfunctions (suspected or definite), must be summarized and substantiated with data (e.g., photos, positions, environmental data, directions, etc.) and observations. Such malfunctions include gaps in the bubble curtain, significant drifting of the bubble curtain, and any other issues which may indicate sub-optimal mitigation performance or are used by Sunrise Wind to explain performance issues. Requirements for actions to be taken based on the results of the SFV are identified in 2.a. above. ii. The final results of SFV for monopile and pin pile installations must be submitted as soon as possible, but no later than within 90 days following completion of pile driving for which SFV was carried out.		

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			e. **Vessel Strike Avoidance Plan.** BOEM, BSEE, and/or Sunrise Wind must submit this plan to NMFS GARFO as soon as possible after issuance of this Biological Opinion but no later than 90 days prior to the planned start of in-water construction activities outside of South Brooklyn Marine Terminal (including cable installation). The plan must provide details on all relevant mitigation and monitoring measures for listed species, vessel speeds and transit protocols from all planned ports, vessel-based observer protocols for transiting vessels, communication and reporting plans, proposed alternative monitoring equipment to maintain vessel strike avoidance zones in varying weather conditions, darkness, sea states, and in consideration of the use of artificial lighting. If Sunrise Wind plans to implement PAM in any transit corridor to allow vessel transit above 10 knots, the plan must describe how PAM, in combination with visual observations, will be conducted to ensure the transit corridor is clear of NARWs. PAM information should follow what is required to be submitted for the PAM Plan in 8(a).		
12	C, O&M, D	RPM 6	To implement the requirements of RPM 6, BOEM, BSEE, NMFS OPR, and USACE must exercise their authorities to assess the implementation of measures to avoid, minimize, monitor, and report incidental take of ESA-listed species during activities described in this Opinion. These agencies must immediately exercise their respective authorities to take effective action to ensure prompt implementation and compliance if Sunrise Wind is not complying with: any avoidance, minimization, and monitoring measures incorporated into the Proposed Action or any T&C(s) specified in this statement, as currently drafted or otherwise amended in agreement between these agencies and NMFS; if agencies fail to do so, the protective coverage of Section 7(o)(2) may lapse.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
13	C, O&M, D	RPM 6	To implement the requirements of RPM 6, Sunrise Wind must consent to on-site observation and inspections by federal agency personnel (including National Oceanic and Atmospheric Administration (NOAA) personnel) during	Marine mammals, sea turtles,	NMFS OPR, BSEE, USACE, & BOEM

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			activities described in the Biological Opinion, for the purposes of evaluating the effectiveness and implementation of measures designed to minimize or monitor incidental take.	and Atlantic sturgeon	
14	C, O&M, D	RPM 6	To implement the requirements of RPM 6, Sunrise Wind, BOEM, BSEE, NMFS OPR, and USACE must immediately notify NMFS GARFO of any identified or suspected non-compliance with any measure outlined in this ITS or in any measure incorporated into the Proposed Action, including measures included in the final MMPA authorization. This includes the suspected or identified failure in effectiveness of any such measure. This notification must be submitted as soon as the issue is identified to nmfs.gar.incidental-take@noaa.gov and must include a description of the non-compliance or failure of effectiveness of the measure, the date the issue was identified, and any corrective actions that were taken. The report of non-compliance must be followed within 48 hours with a request to meet with NMFS GARFO to discuss the report and seek concurrence from NMFS GARFO on the corrective measures.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]

Species	Clearance Zone (m)	Shutdown Zone (m)
Impact pile driving for foundation installation		
North Atlantic right whale (NARW) – visual PSO	Monopile, Sequential/Consecutive*: Minimum visibility zone (2,700 m May-November; 3,000 m December) plus any additional distance observable by the visual PSOs Monopile, Concurrent*: Minimum visibility zone (3,500 m May-November; 4,000 m December) plus any additional distance observable by the visual PSOs Jacket: Minimum visibility zone (3,700 m May-November; 4,100 m December) plus any additional distance observable by the visual PSOs	Monopile, Sequential: Minimum visibility zone (2,700 m May-November; 3,000 m December) plus any additional distance observable by the visual PSOs Monopile, Concurrent: Minimum visibility zone (3,500 m May-November; 4,000 m December) plus any additional distance observable by the visual PSOs Jacket: Minimum visibility zone (3,700 m May-November; 4,100 m December) plus any additional distance observable by the visual PSOs
NARW – PAM WTG and OCS–DC foundations (10,000 m monitoring zone)	At any distance within the 10,000 m monitoring zone	At any distance within the 10,000 m monitoring zone
Blue, fin, sei, and sperm whale – WTG foundation (visual and PAM monitoring)	Monopile, Sequential: 4,000 m May-November; 4,300 m December Monopile, Concurrent: 5,300 m May-November; 6,300 m December	Monopile, Sequential: 4,000 m May-November; 4,300 m December Monopile, Concurrent: 5,300 m May-November; 6,300 m December

<table>
<tr><th>No.</th><th>Proposed Project Phase</th><th>Mitigation & Monitoring Measures</th><th>Table H-2
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<tr><th>Species</th><th>Clearance Zone (m)</th><th>Shutdown Zone (m)</th></tr>
<tr><td colspan="3">Impact pile driving for foundation installation</td></tr>
<tr><td>Blue, fin, sei, and sperm whale – OCS–DC foundation (visual and PAM monitoring)</td><td>5,600 May-November (6,500 December)</td><td>5,600 May - November (6,500 December)</td></tr>
<tr><td>Sea Turtles</td><td>500</td><td>500</td></tr>
<tr><td colspan="3">Pile Driving for Cable Landfall Activities- visual PSOs</td></tr>
<tr><td>right, blue, fin, sei, and sperm whale – sheet pile (vibratory)</td><td>200</td><td>50</td></tr>
<tr><td>right, blue, fin, and sei whale – casing pipe (impact)</td><td>500</td><td>500</td></tr>
<tr><td>sperm whale – casing pipe (impact)</td><td>100</td><td>100</td></tr>
<tr><td>Sea Turtles</td><td>500</td><td>500</td></tr>
<tr><td colspan="3">Unexploded Ordinances/Munitions of Explosive Concern Detonations</td></tr>
<tr><td>NARW, blue, fin, and sei whale</td><td>10,000</td><td>NA</td></tr>
<tr><td>Sperm whale</td><td>2,000</td><td>NA</td></tr>
<tr><td>Sea Turtles</td><td>500</td><td>NA</td></tr>
</table>
Note: these are the clearance and shutdown zones incorporated into the Proposed Action; the zones for marine mammals reflect the proposed conditions of the MMPA ITA, as modified during the consultation period, and the zones for sea turtles reflect the zone sizes identified in BOEM's BA as modified for UXOs by this ITS. Further modification may be included in the final MMPA ITA.
NA=not applicable; *On any day that concurrent pile driving is planned, we expect the "concurrent" zone sizes will be in effect.</td><td></td><td></td></tr>
<tr><td>14 cont.</td><td>C, O&M, D</td><td>RPM 1 and 2/T&C 1</td><td>The proposed ITA includes a number of general conditions and specific mitigation measures that are considered part of the Proposed Action. The final ITA issued under the MMPA may have modified or additional measures that clarify or enhance the measures identified in the proposed ITA. Compliance</td><td>Marine mammals</td><td>NMFS OPR, BSEE, USACE, & BOEM</td></tr>
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No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			with those measures is necessary and appropriate to minimize and document incidental take of North Atlantic right, sperm, sei, and fin whales. As such, the T&C that require BOEM, BSEE, USACE, and NMFS OPR to ensure compliance with the conditions and mitigation measures of the final ITA are necessary and appropriate to minimize the extent of take of these species and to ensure that take is documented.		
14 cont.	C, O&M, D	RPM 1/T&C 2	The Proposed Action incorporates requirements for sound field verification (SFV) and outlines general measures to be implemented as a result of SFV. T&C 2 is necessary and appropriate to provide clarification of the required steps related to sound field verification and measures to be implemented as a result of sound field verification. Additionally, this measure requires abbreviated SFV monitoring, using a single hydrophone, during all foundation pile driving where full SFV monitoring is not carried out. This requirement implements one of the recommendations included in BOEM's August 2023 *Recommendations for Offshore Wind Project Pile Driving Sound Exposure Modeling and Sound Field Measurement*. This measure is necessary and appropriate to monitor take; the exposure estimates and amount and extent of incidental take exempted in this ITS are based on the size of the area that will experience noise above the identified thresholds during pile driving. While the initial, full SFV monitoring, and the associated steps to require any changes to the NAS, are designed to ensure that pile driving will proceed in a way that is not expected to exceed the modeled distances, there is likely to be variability in pile driving and there may be issues with the sound attenuation systems (e.g., poor bubble curtain performance) that would be undetected without at least minimal SFV monitoring. We expect that the required abbreviated SFV will both allow a continuous check on noise levels and the attenuation system which will allow us to monitor take in a way that supplements detections of sea turtles and whales by the PSOs, but also allow for expeditious detection of any issues with the NAS or unanticipated variations in noise produced during pile driving so	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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			that adjustments can be made and Sunrise Wind can avoid exceeding the amount and extent of take exempted herein. Additionally, we have determined in this Opinion that take of Atlantic sturgeon as a result of exposure to pile driving noise is not expected and no take has been exempted; because PSOs cannot see sturgeon, this abbreviated SFV monitoring will allow for monitoring of noise levels to compare to the modeled distances to the injury and behavioral disturbance thresholds for sturgeon and ensure that these distances are not exceeded.		
14 cont.	C, O&M, D	RPM 2/T&Cs 3 and 4	The Proposed Action incorporates a clearance zone for sea turtles that is the same size as the greatest distance from the detonation that is expected to have noise above the PTS threshold (472 m). The measure included in T&C 3a will expand the size of the clearance zone to 500 m (1,640 ft). The expansion of the clearance zone minimizes the risk that a sea turtle just outside the clearance zone would enter the area where noise would be above the PTS threshold before the detonation occurred. Given the extensive PSO coverage, including aerial coverage, that will be required during UXO detonations, we expect that this larger area will be able to be effectively monitored. Implementation of this measure will serve to minimize take. T&C 3b requires NMFS to be notified 48-hours in advance of any planned detonation. This notification will allow us to alert NMFS sea turtle and marine mammal stranding network partners, consistent with best practices, who can then be on alert for any reports of injured or distressed animals, which will assist in monitoring the effects of the detonations. This measure includes a clause for reduced notification period if a 48-hour delay would result in imminent risk of human life or safety. T&C 4 is necessary and appropriate to provide clarification of the required steps related to SFV and measures to be implemented as a result of SFV as described above for SFV for pile driving.	Marine mammals, sea turtles	NMFS OPR, BSEE, USACE, & BOEM

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14 cont.	C, O&M, D	RPM 3/T&C 5	As explained above, take that may occur of Atlantic and shortnose sturgeon as a result of vessel strike is expected to occur from Sunrise Wind vessels transiting in the Delaware River/Bay as they move to/from the Paulsboro Marine Terminal. In this Opinion, we have identified the portion of the take identified in the Paulsboro Biological Opinions that will be attributable to Sunrise Wind vessels. That take is exempted through the ITS issued with NMFS' Biological Opinions for that project. Here, we identify the relevant RPMs and T&C from that ITS that must be complied with in order for the relevant take exemption included in the Paulsboro Opinion to apply.	Atlantic and shortnose sturgeon	NMFS OPR, BSEE, USACE, & BOEM
14 cont.	C, O&M, D	RPM 4/T&Cs 6, 7 and 10	Documenting take that occurs is essential to ensure that reinitiation of consultation occurs if the amount or extent of take identified in the ITS is exceeded. Some measures for documenting and reporting take are included in the Proposed Action. The requirements of T&Cs 6, 7, and 10 enhance or clarify those requirements. Documentation and timely reporting of observations of whales, sea turtles, and Atlantic sturgeon is important to monitoring the amount or extent of actual take compared to the amount or extent of take exempted. The reporting requirements included here will allow us to track the progress of the action and associated take. Proper identification and handling of any sturgeon and sea turtles that are captured in the survey gear is essential for documenting take and to minimize the extent of that take (i.e., reducing the potential for further stress, injury, or mortality). The measures identified here are consistent with established best practices for proper handling and documentation of these species. Identifying existing tags helps to monitor take by identifying individual animals. Requiring genetic samples (fin clips) from all Atlantic sturgeon and that those samples be analyzed to determine the DPS of origin is essential for monitoring actual take as genetic analysis is the only way to identify the DPS of origin for subadult and adult Atlantic sturgeon captured in the ocean. Taking fin clips is not expected to increase stress or result in any injury of Atlantic sturgeon. The requirements for observer qualifications in T&C	Marine mammals, sea turtles, and Atlantic and shortnose sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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			10 are necessary and appropriate to ensure that handling and documentation of sturgeon and turtles collected in the trawl survey is done by appropriately trained personnel, which will minimize the extent of take by reducing the risk of unintentional stress or injury that could result from inappropriate or extended handling of captured individuals.		
14 cont.	C, O&M, D	RPM 4/T&C 8	We recognize that documenting sea turtles that were struck by Project vessels may be difficult given their small size and the factors that contribute to cryptic mortality addressed in the Effects of the Action section of this Opinion. Therefore, we are requiring that BOEM, BSEE, and Sunrise Wind document any and all observations of dead or injured sea turtles over the course of the Project and that we meet twice annually to review that data and determine which, if any, of those sea turtles have a cause of death that is attributable to Project operations. We expect that we will consider the factors reported with the particular turtle (i.e., did the lookout suspect the vessel struck the turtle), the state of decomposition, any observable injuries, and the extent to which Project vessel traffic contributed to overall traffic in the area at the time of detection.	Sea turtles	NMFS OPR, BSEE, USACE, & BOEM
14 cont.	C, O&M, D	RPM 4/T&C 9	T&C 9 requires BOEM, BSEE, and/or USACE to provide updates on certain Project information (listed in the condition) to us following BSEE's review of the Facility Design Report (FDR) and/or FIR or whenever the identified information is available. Because Sunrise Wind used a Project Design Envelope for environmental permitting, a number of the Project parameters have not been finalized. Receipt of this information from BOEM, BSEE, or USACE is necessary for us to ensure that the Project to be constructed is consistent with the description of the Proposed Action in the Opinion and allows us an opportunity to identify if any changes to the ITS will be appropriate. For example, if the Project described in the FDR includes significantly fewer WTG foundations than described in the Opinion, adjustments to the amount of	Marine mammals, sea turtles, and Atlantic and shortnose sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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			exempted take may be appropriate. Requiring the submission of information on how the Project will be implemented is necessary and appropriate to allow us to determine if the amount or extent of take is likely to be exceeded (or alternatively, if it would be an overestimate), and allows for us to accurately monitor the Proposed Action and associated incidental take		
14 cont.	C, O&M, D	RPM 5/T&C 11	A number of plans are proposed for development and submission by Sunrise Wind and/or required for submission by BOEM, BSEE, or NMFS OPR. T&C 11 identifies all of the plans that must be submitted to NMFS GARFO, identifies timeline for submission, and clarifies any relevant requirements. This will minimize confusion over submission of plans and facilitate efficient review of the plans. Implementation of these plans will minimize or monitor take, dependent on the plan. Obtaining NMFS concurrence with these plans prior to implementation of the associated activity is necessary and appropriate to ensure that the activities are carried out in a way that is consistent with the Proposed Action described herein, including compliance with the avoidance, minimization, or monitoring measures built into the Proposed Action, or to ensure that the measures outlined in this ITS are implemented as intended. Preparation, review, and concurrence with these plans is necessary because the relevant details were not available at the time this consultation was initiated or completed.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
14 cont.	C, O&M, D	RPM 6/T&C 12-14	RPM 6 and its associated T&Cs are reasonable and necessary or appropriate to minimize and monitor incidental take. Measures to minimize and monitor incidental take, whether part of the Proposed Action or this ITS, first must be implemented in order to achieve the beneficial results anticipated in this Opinion for ESA-listed species. The action agencies exercising their authorities to assess and ensure compliance with the measures to avoid, minimize, monitor, and report incidental take of ESA-listed species, including the measures that were incorporated into the description of the Proposed Action	ESA-listed species	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			is an essential component of ensuring that incidental take is minimized and monitored. Likewise, such measures once implemented must be effective at minimizing and monitoring incidental take consistent with the analysis. While the measures described as part of the Proposed Action and in the ITS are consistent with best practices in other industries, and are anticipated to be practicable and functional, gathering information in situ through observation, inspection, and assessment may confirm expectations or reveal room for improvement in a measure's design or performance, or in Sunrise Wind's implementation and compliance. While the ITS states that action agencies must adopt the RPMs and T&Cs as enforceable conditions in their own actions, and while each agency is responsible for oversight regarding its own actions taken, specifying that Sunrise Wind must consent to NOAA (or other enforcement related) personnel's attendance during offshore wind activities clarifies its role as well. Given the nascence of the U.S. offshore wind industry information gathering on the implementation and effectiveness of these measures will help ensure that effects to listed species and their habitat are minimized and monitored. T&C 14 requires prompt notification of any non-compliance with measures that are designed to avoid, minimize, or monitor effects to ESA-listed species; this is necessary not only to monitor incidental take and the implementation of this ITS but also to ensure that appropriate corrective actions are taken. This will also facilitate identification of any need to reinitiate this consultation.		
Conservation Recommendations from the NMFS Biological Opinion Issued September 28, 2023					
1	C	Pile driving time of year restrictions	Work with the Lessee to develop a construction schedule that further reduces potential exposure of NARWs to noise from pile driving including avoiding impact pile driving in May and December.	Marine mammals	NMFS OPR, BSEE, USACE, & BOEM

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2	C	Data collection	Collect data to add to the limited information we have on underwater noise generated during vibratory pile driving for installation and removal of sheet piles and on operational noise of the direct drive wind turbines in the action area. i. If sheet pile cofferdams are used at the sea-to-shore transition, SFV should be carried out during installation and removal of at least one cofferdam. ii. A study to document operational noise of WTGs during a variety of wind and weather conditions should be carried out.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
3	C, O&M, D	R&D support	Support research and development of technology to aid in the minimization of risk of vessel strikes on marine mammals, sea turtles, and Atlantic sturgeon.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
4	C, O&M, D	Monitoring collaboration	Support development of regional monitoring of Project and cumulative effects through the Regional Wildlife Science Collaborative for Offshore Wind (RWSC).	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
5	C, O&M, D	Monitoring collaboration	Work with the NEFSC to support robust monitoring and study design with adequate sample sizes, appropriate spatial and temporal coverage, and proper design allowing the detection of potential impacts of offshore wind projects on a wide range of ecological and oceanographic conditions including protected species distribution, prey distribution, pelagic habitat, and habitat usage.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
6	C, O&M, D	R&D support	Support research into understanding the effects of offshore wind on regional oceanic and atmospheric conditions through modeling and data collection, and assessment of potential impacts on protected species, their habitats, and distribution of zooplankton and other prey.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
7	C, O&M, D	Monitoring collaboration	Support the continuation of aerial surveys for post-construction monitoring of listed species in the Sunrise Wind Project Area and surrounding waters, and methods for survey adaptation to the presence of wind turbines.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
8	C, O&M, D	R&D support	Support research on construction and operational impacts to protected species distribution, particularly the NARW and other listed whales. Conduct monitoring pre/during/post construction, including long-term monitoring during the operational phase, including sound sources associated with turbine maintenance (e.g., service vessels), to understand any changes in protected species distribution and habitat use in southern New England.	Marine mammals	NMFS OPR, BSEE, USACE, & BOEM
9	C, O&M, D	R&D support	Support the deployment of acoustic tags on sea turtles and sturgeon and the continued maintenance of the receiver array in the Sunrise Wind - wind development area (WDA).	Sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
10	C, O&M, D	R&D support	Support research regarding the abundance and distribution of Atlantic sturgeon in the Sunrise Wind WDA and surrounding region in order to understand the distribution and habitat use and aid in density modeling efforts, including the continued use of acoustic telemetry networks to monitor for tagged fish.	Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM

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11	C, O&M, D	Monitoring collaboration	Require the Lessee to send all acoustic telemetry metadata and detections to the Mid-Atlantic Acoustic Telemetry Observation System (MATOS) database via https://matos.asascience.com/ for coordinated tracking of marine species over broader spatial scales in U.S. Animal Tracking Network and Ocean Tracking Network.	Marine mammals, sea turtles, and Atlantic sturgeon	NMFS OPR, BSEE, USACE, & BOEM
12	C, O&M, D	Monitoring collaboration	Conduct or support long-term ecological monitoring to document the changes to the ecological communities on, around, and between foundations and other benthic areas disturbed by the proposed Project.	Benthic resources	NMFS OPR, BSEE, USACE, & BOEM
13	C, O&M, D	Monitoring collaboration	Develop or support the development of a PAM array in the Sunrise Wind WDA to monitor changes in ambient noise and use of the area by baleen whales (and other marine construction, and to detect small-scale changes at the scale of the Sunrise Wind WDA. Bottom mounted recorders should be deployed at a maximum of 20 km distance from each other throughout the given study area in order to ensure near to complete coverage of the area over which NARWs and other baleen whales can be heard. See Van Parijs et al. 2021 for specific details. Resulting data products should be provided according to https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates.	Marine mammals	NMFS OPR, BSEE, USACE, & BOEM
14	C, O&M, D	Monitoring collaboration	Support the development of a regional PAM network across lease areas to monitor long-term changes in baleen whale distribution and habitat use. A regional PAM network should consider adequate array/hydrophone design, equipment, and data evaluation to understand changes over the spatial scales that are relevant to these species for the duration of these projects, as well as the storage and dissemination of these data.	Marine mammals	NMFS OPR, BSEE, USACE, & BOEM

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15	C, O&M, D	Monitoring collaboration	Monitor changes in commercial fishing activity to detect changes in bycatch or entanglement rates of protected species, particularly the NARW, and support the adaptation of ropeless fishing practices where necessary. Conduct regular surveys and removal of marine debris from Project infrastructure.	Protected species, NARW	NMFS OPR, BSEE, USACE, & BOEM
16	C, O&M, D	Monitoring collaboration	Provide support to groups that participate in regional stranding networks.	All types of stranding	NMFS OPR, BSEE, USACE, & BOEM
NMFS Essential Fish Habitat Conservation Recommendations dated September 14, 2023[4]					
1	C	Time of year restriction	To minimize adverse effects to Atlantic cod spawning aggregations within and adjacent to the Project Area, and to reduce the risk of population-level effects to this species, no pile driving should occur in the Lease Area between November 1 and March 31 of each year.	Atlantic cod spawning	BOEM
2	C	Priority Area 1	In-water bottom disturbing construction activities should not be permitted to occur within Priority Area 1 (inclusive of WTG 123 and 124) between November 1 and March 31 of each year to minimize impacts to Atlantic cod spawning. Bottom disturbing activities should be sequenced so that construction during this time is occurring within the southernmost and easternmost portion of the lease and construction in areas adjacent to Priority	Atlantic cod spawning	BOEM

[4] NMFS issued conservation recommendations to BOEM and USACE for the Sunrise Wind Project via letter on September 14, 2023. As required by section 305(b)(4)(B) of the Magnuson-Stevens Act, USACE and BOEM will provide a detailed response to these conservation recommendations to NMFS regarding which measures will be adopted, partially adopted, or not adopted along with a rationale. At the time of FEIS issuance, BOEM and USACE have yet not determined which conservation recommendations each agency intends to adopt or partially adopt. As such, the full list of conservation recommendations received from NMFS is included in this document.

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			Area 1 is minimized to the greatest extent practicable between November 1 and March 31 of each year.		
3	C	Detonation	To the extent practicable, detonation of UXO/MEC should not be conducted in the Lease Area from November 1 through March 31 of each year.	Atlantic cod spawning	BOEM
4	C	Priority Area 1	HRG sub-bottom profiling (e.g., sparkers, boomers) survey activities should not be permitted to occur in Priority Area 1, inclusive of WTG 123 and 124, between November 1 through March 31 of each year.	Atlantic cod spawning	BOEM
5	Project design	Priority Area 1	To minimize adverse impacts to Atlantic cod spawning habitats, the maximum number of turbines feasible should be removed or relocated outside of Priority Area 1 (inclusive of WTG 123 and 124) to avoid areas of cod spawning and complex habitats. Specifically, at a minimum the following 7 WTG locations and associated inter array cables should be removed in the following order of priority to minimize overlap with Atlantic cod spawning habitat: 92, 93, 94, 91, 95, 122 and 123. Turbine locations that have the highest overlap with and closest proximity to Atlantic cod detections and complex habitats should be prioritized for removal or relocation. Turbines are numbered based on WTG labels identified in the essential fish habitat (EFH) assessment.	Atlantic cod spawning	BOEM
6	C	Surveys in Lease Area	Support planned and ongoing passive acoustic and telemetry surveys within the Lease Area and expand the existing study to cover the full area of Project effects, including areas of hydrodynamic and acoustic effects that are expected to extend beyond the boundaries of the Lease Area. This should be conducted pre-, during, and post construction to identify the full scope of the area affected by Project construction and operation and to assess individual, synergistic, and cumulative effects of the Project on cod spawning activity. Specifically, a) Provide continuous monitoring of Atlantic cod spawning aggregations within and immediately adjacent to the Lease Area between	Atlantic cod spawning	BOEM

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			November 1 and March 31 prior to the construction of the Project, during Project construction, and post construction b) Place additional passive acoustic receivers within the Lease Area to increase coverage. c) Add an additional glider to the ongoing survey to increase the spatial coverage of the Sunrise Wind Project Area and adjacent areas. The ongoing survey should focus on increasing survey coverage (i.e. increase the number of glider tracts) within the Project Area to provide better resolution and detection of cod spawning activity within the Project Area before, during, and after construction d) The survey coverage should extend outside the Lease Area within areas where Project effects occur (i.e. wind wake effects) to assess individual, synergistic and cumulative effects of the Project on the distribution of cod spawning activity e) Data and results from this study should be made available to NMFS Habitat and Ecosystem Services Division (HESD) at NMFS.GAR.HESDoffshorewind@noaa.gov		
7	Project design	Priority Area 1	To minimize entertainment of eggs and larvae from the cooling water intake system (CWIS), relocate the OCS–DC outside of Priority Area 1 to a position further south and east in the Lease Area. The OCS–DC should be sited as far from documented Atlantic cod spawning activity as feasible and outside sensitive benthic habitat2 associated with Cox Ledge.	Atlantic cod spawning	EPA
8	O&M	OCS-DS	The OCS–DC CWIS should be retrofitted with a closed-cycle cooling system when the technology is made commercially viable. The feasibility of upgrading the proposed CWIS with a closed-cycle cooling system and/or incorporating best available technologies should be evaluated every 5 years upon re-application of the National Pollutant Discharge Elimination System (NPDES) permit for operation of the OCS–DC. This should be included as a condition of COP approval and the NPDES permit.	Atlantic cod spawning	EPA

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9	O&M	Monitoring	Ichthyoplankton monitoring at the OCS–DC CWIS should be required for the life of the Project. The ichthyoplankton monitoring should incorporate comments provided in Appendix B into the final NPDES permit. All data and results from the ichthyoplankton and thermal monitoring should be made available to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov.	Atlantic cod spawning	EPA
10	O&M	Monitoring	To assess impacts to Atlantic cod eggs and larvae, ichthyoplankton monitoring frequency should be increased from quarterly sampling to weekly sampling during peak cod egg and larval presence from December through April of each year.	Atlantic cod spawning	EPA
11	Project design, D	Number of WTG	No more than the minimum number of wind turbine generators (WTGs) required to meet the power purchase agreement of 880 megawatts (MW) should be permitted with a focus of full removal of WTGs from areas of cod spawning and complex habitats.	Atlantic cod spawning and benthic habitat	BOEM
12	Project design	Avoidance	WTGs, the offshore converter station – direct current (OCS–DC) and cables (inter-array and export) should be microsited/sited to avoid sensitive benthic habitats and UXOs/MECs. Soft bottom areas (identified by low multibeam backscatter returns) absent benthic features should be targeted for micrositing.	Atlantic cod spawning and benthic habitat	BOEM
13	Project design	Avoid and minimize	Develop and implement a WTG, OCS–DC and cable micrositing plan to facilitate the avoidance and minimization of impacts to sensitive benthic habitats. The plan should primarily use multibeam backscatter data, bathymetry and boulder data layers to inform micrositing. 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	Atlantic cod spawning and benthic habitat	BOEM

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			(i.e. areas of medium to high backscatter) with high density large boulders; (ii) complex habitats (i.e. areas of medium to high backscatter) with medium density large boulders; (iii) complex habitats (i.e. areas of medium to high backscatter) with low density large boulders; (iv) complex habitats (i.e. areas of medium to high backscatter) with scattered large boulders; and (v) complex habitats (i.e. areas of medium to high backscatter) with no large boulders. A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.govprior to construction.		
14	Project design	Avoidance	To the extent practicable, if cables must cross complex habitat or benthic features (i.e., sand waves), they should be located at the narrowest points to cross perpendicularly to reduce the extent of sand wave leveling/dredging required; dredged material should not be disposed of within sensitive benthic habitats.	Atlantic cod spawning and benthic habitat	BOEM
15	Pre-C	Boulder relocation	To minimize impacts to sensitive benthic habitats from boulder/cobble removal/relocation activities, boulders and cobbles should be: (i) relocated as close to the impact area as practicable, in areas immediately adjacent to existing similar complex bottom; (ii) placed in a manner that does not hinder navigation or impede commercial fishing; (iii) and avoids impacts to existing complex habitats.	Atlantic cod spawning and benthic habitat	BOEM
16	Pre-C	Boulder relocation	In order to minimize impacts to sensitive benthic habitats from boulder/cobble removal/relocation activities, boulders that will be relocated using boulder "pick" methods should be relocated outside the area necessary to clear and placed along the edge of existing complex habitats such that the placement of the relocated boulders will result in a marginal expansion of complex habitats into soft-bottom habitats.	Atlantic cod spawning and benthic habitat	BOEM

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17	Pre-C	Avoidance	Develop and implement a boulder relocation plan to facilitate the avoidance and minimization of impacts to sensitive benthic habitats. We recommend the plan use multibeam backscatter data and boulder layers (data) to inform micrositing. A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction.	Atlantic cod spawning and benthic habitat	BOEM
18	Pre-C, C, D	Seafloor preparation	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 and side scan sonar) capable of detecting bathymetry changes of 0.5 m (1.6 ft) 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	Atlantic cod spawning and benthic habitat	BOEM
19	Pre-C	Seafloor conditions	In areas where plows, jets, or other similar methods are used and the created berm height exceeds 3 ft (2 m) above the existing grade, the created berm should be restored to match that of the existing grade/pre-construction conditions.	Atlantic cod spawning and benthic habitat	BOEM
20	Pre-C	Anchoring	Avoid anchoring or placing jack-up barge spud cans or footings on/in sensitive benthic habitats including any area where large boulders (>/= 0.5 m in diameter) or medium to high multibeam backscatter returns occur.	Atlantic cod spawning and benthic habitat	BOEM

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21	Pre-C	Sensitive benthic habitats	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.	Atlantic cod spawning and benthic habitat	BOEM
22	Pre-C, C, O&M, D	Anchoring	If anchoring must occur in any sensitive benthic habitats and vessels must remain stationary, dynamic positioning systems or mid-line buoys on anchor chains should be required to minimize impacts to those habitats.	Atlantic cod spawning and benthic habitat	BOEM
23	C	Spud Can placement	If placement of jack-up barge spud cans is necessary in sensitive benthic habitats, we recommend 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) with high density large boulders; (ii) complex habitats (i.e. areas of medium to high backscatter) with medium density large boulders; (iii) complex habitats (i.e. areas of medium to high backscatter) with low density large boulders; (iv) complex habitats (i.e. areas of medium to high backscatter) with scattered large boulders; (v) complex habitats (i.e. areas of medium to high backscatter) with no large boulders.	Atlantic cod spawning and benthic habitat	BOEM
24	Pre-C	Anchoring and jack-up barge	Develop and implement an anchoring and jack-up barge plan to facilitate the avoidance and minimization of impacts to sensitive benthic habitats. We recommend the plan use multibeam backscatter data, bathymetry and boulder layers (data) to inform micrositing. A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.govprior to construction.	Atlantic cod spawning and benthic habitat	BOEM

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25	C	Cables	To minimize permanent adverse impacts to 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.	Atlantic cod spawning and benthic habitat	BOEM
26	C	Scour protection	To minimize the impacts of habitat conversion from scour protection, natural or engineered rounded stone of consistent grain size that mimics natural seafloor substrates should be used. At a minimum, any exposed surface layer should be designed and selected to provide three-dimensional structural complexity that creates a diversity of crevice sizes (e.g., mixed stone sizes) and rounded edges (e.g., tumbled stone), and be sloped such that outer edges match the natural grade of the seafloor. Should the use of concrete mattresses be necessary, bioactive concrete (i.e., with bio-enhancing admixtures) should be used as the primary scour protection (e.g., concrete mattresses) or veneer to support biotic growth.	Atlantic cod spawning and benthic habitat	BOEM
27	Pre-C	Scour protection	Develop and implement a scour protection plan to facilitate the avoidance and minimization of impacts to sensitive benthic habitats. We recommend the plan use multibeam backscatter data, bathymetry and boulder layers (data) to inform this plan. A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.govprior to construction.	Atlantic cod spawning and benthic habitat	BOEM
28	C	Noise during pile driving	The use of noise mitigating measures should be required during pile driving construction in the nearshore and offshore Project Areas, including the use of soft-start procedures and the deployment of noise dampening equipment such as bubble curtains or double-bubble curtains.	Atlantic cod spawning and	BOEM

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				benthic habitat	
29	Pre-C	Noise mitigation measures	A plan outlining the noise mitigation procedures for offshore activities should be filed with BOEM and the USACE for approval before construction commences. BOEM should provide NMFS HESD with a copy of the final plan at NMFS.GAR.HESDoffshorewind@noaa.govbefore 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 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	Atlantic cod spawning	BOEM, USACE
30	C, D	Temporary pier	Vibratory pile driving should be used to the maximum extent practicable for both installation and removal of the temporary pier.	Atlantic cod spawning	USACE
31	C	Time of year restrictions	Avoid in-water work within Narrow Bay/Long Island Intracoastal Waterway including installation and removal of the temporary pier, or other extractive or turbidity/sediment-generating activities from January 15 to May 31 of each year in estuarine/nearshore waters of 6 m (20 ft) in depth or less to avoid impacts to winter flounder early life stages (eggs, larvae).	Atlantic cod spawning	USACE
32	Pre-C, C & D	Cables	In all inshore/estuarine habitats where seafloor preparation and cable installation activities will occur, impacts to sensitive benthic habitats should be avoided and minimized through the use of horizontal directional drilling (HDD), micrositing, and rerouting. All disturbed areas should be restored to pre-construction conditions, inclusive of bathymetry, contours, and sediment	Estuarine and inshore habitat	USACE

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			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		
33	C, O&M, D	Tides	To minimize impacts from vessel operation in estuarine/nearshore habitats, all vessels should float at all stages of the tide (i.e., avoid vessel grounding); all vessels should be required to follow other EFH CRs associated with anchoring/avoidance.	Estuarine and inshore habitat	USACE
34	C	Trenching	Avoid trenching in open nearshore/estuarine waters. If open trenching is used, excavated materials should not be sidecast or placed in the aquatic environment.	Estuarine and inshore habitat	USACE
35	C, D	Unconfined dredging	To minimize impacts to estuarine/nearshore habitats associated with excavation of the HDD exit pits for any water-to-shore transitions, unconfined dredging should not be permitted.	Estuarine and inshore habitat	USACE
36	C, D	Dredged materials	All materials excavated should be stored on uplands or barges and placed back to restore the excavated areas, or removed to a suitable upland disposal site if the material contains elevated levels of contaminants. Dredged materials from HDD exit pits should be stored on a barge or on uplands and used to backfill the excavated areas or removed to a suitable upland disposal site if the material contains elevated levels of contaminants. HDD exit pits should be restored to pre-construction conditions with native and/or clean, compatible material once construction and installation is complete.	Estuarine and inshore habitat	USACE
37	Pre-C	Frac-out	Frac-out plans should be developed for all areas where HDD is proposed to be used. We recommend these plans be developed with particular attention to protecting submerged aquatic vegetation (SAV) that has been documented within the Long Island Intracoastal Waterway. A copy of the final plan should	Estuarine and	USACE

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			be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.govprior to construction.	inshore habitat	
38	C	Temporary pier	Avoid seabed disturbing activities in SAV, particularly during installation of the temporary pier. At a minimum a) barges should not be moored in SAV or SAV habitat, b) Maintain a minimum 100 ft. buffer between the edge of any SAV beds and any equipment staging or anchoring activities c) Maps derived from SAV surveys should be provided to vessels/captains to ensure SAV is avoided.	Estuarine and inshore habitat	USACE
39	C	Compensatory Mitigation Plan	Should the Project unintentionally impact SAV through frac-out, mooring in the SAV bed, or other direct or indirect effects from construction of the Project, compensatory mitigation should be provided for all areas of SAV impacted by construction activities including cable installation and dredging at a minimum ratio of 3:1. A Compensatory Mitigation Plan that satisfies each element of a complete Compensatory Mitigation Plan, as identified in the published regulations 33 *CFR* Parts 325 and 332 "Compensatory Mitigation for Losses of Aquatic Resources," (Mitigation Rule) and NOAA's Mitigation Policy for Trust Resources should be required for any impacts to SAV.	Estuarine and inshore habitat	USACE
40	Project design	Benthic monitoring plan	We recommend the Benthic Habitat Monitoring Plan dated April 8, 2022, be updated to include the following: a. Incorporation of comments provided by NOAA Fisheries on September 24, 2021, related to temporal scale of sampling, statistical design, survey technique strategies, sampling strata selection, and others, which have not been incorporated in the April 2022 version. This should include increasing the extent of sampling in existing habitats in the Project Area. b. Pre-construction/baseline monitoring for a minimum of 3 years prior to any construction activities and continue annually for a minimum of 5 years post-construction.	Benthic habitats	BOEM

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			c. An expansion of hard bottom habitat monitoring to include natural hard bottom habitats from both disturbed (relocated boulders) and undisturbed habitats. The inclusion of natural hard bottom habitats in the monitoring plan should allow for direct comparison of species assemblage composition and successional stage of natural vs introduced hard bottom habitat. d. Invasive species (e.g., Didemnum vexillum) monitoring as a discrete component within both the natural and introduced hard bottom monitoring to track the fragmentation and spread of invasive species across the lease as a result of construction activities. e. The inclusion of undisturbed soft bottom habitats in the soft bottom habitat monitoring plan to investigate impacts of cumulative lease development on soft sediment community composition and function. f. Lease-wide collection of acoustic data (multibeam bathymetry and backscatter and side scan sonar) post-construction to measure the total area subject to physical change as a result of lease development. Post-construction acoustic surveys should be able to answer 1.) How much soft-bottom habitat across the lease has been converted to hard bottom; 2.) How much hard-bottom habitat across the lease has been converted to soft-bottom; 3.) How much natural hard-bottom habitat across the lease has been converted into man-made hard-bottom; 4.) How much total man-made hard bottom has been introduced into the lease; 5.) How much hard bottom habitats have been impacted (i.e., relocated, fragmented, reduced in complexity, etc.) by the Project compared with pre-construction surveys; 6.) Have sand wave habitats dredged and leveled during cable installation been restored?		

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41	O&M	Project specific monitoring plan for EFH and ESA	Develop an in-situ Project specific monitoring program to address impacts of the operation of the Sunrise Wind Project on EFH and federally managed species. This monitoring recommendation is consistent with principles outlined in NOAA's Mitigation Policy for Trust Resources which highlights the use of the best available scientific information, such as results of surveys and other data collection efforts when existing information is not sufficient for the evaluation of Proposed Actions and mitigation, or when additional information will facilitate more effective or efficient mitigation recommendations. Incorporation of this monitoring recommendation will further align the monitoring efforts at Sunrise Wind with the NOAA Fisheries and BOEM Federal Survey Mitigation Strategy, which has evaluation and integration of wind energy monitoring studies with NOAA Fisheries surveys as a primary goal. The Project specific monitoring program should measure in situ the stressors created by Project operation on the ecosystem from operational noise, electromagnetic fields (EMF), wind wake effects, and the presence of structures. Studies should also evaluate the biological effects of those stressors on commercially important species in the Project Area such as American lobster, Atlantic cod, Atlantic sea scallops, black sea bass, Jonah crab, monkfish, ocean quahog, silver hake, scup, skates, and summer flounder. Monitoring plans should include the collection of a minimum of 3 years of baseline data, during construction, and a minimum of 5 years of post-construction data collection. Plans should be incorporated into a comprehensive monitoring strategy and be provided to NOAA Fisheries GARFO and NEFSC for review and comment within 90 days of Record of Decision (ROD) issuance. A response to NOAA Fisheries comments should be provided. These monitoring studies should be developed in partnership with NOAA Fisheries and other scientific institutions to aid in addressing the following questions:	EHF and managed species	BOEM

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			a. How far do effects on sound pressure, particle motion, and substrate vibration extend from the individual WTGs and the Sunrise Wind Farm collectively? i. What effect do these operational noise effects have on the distribution of larvae for species with designated EFH in the Project Area and prey for these species (i.e. sand lance)? b. What is the spatial distribution of the EMF emissions around inter-array and export cables? The proposed EMF study for the export cables should be expanded to measures EMF emissions from the inter-array cables and the export cables and address the following: i. What is the behavioral response to the altered EMF of fisheries resource species/life stages with known EMF-sensitivity? ii. Is there a difference in behavioral responses from the high voltage alternative current (HVAC) cables associated with the inter-array cables compared with the high voltage direct current (HVDC) cables along the export cable route? c. How far does the marine and atmospheric wind wake extend from the Sunrise Wind Farm during operation? i. What are the effects on physical water column properties, primary and secondary production, and larval dispersal for species with designated EFH in the Project Area? d. What is the distribution, abundance, survival, growth rate, and recruitment rate of cod larvae along a distance gradient from offshore wind structures (OCS–DC and turbine foundations)? This question could be addressed by extending the ichthyoplankton study to areas in the lease beyond the OCS–DC. This should include the effect of entrainment, increased water temperature, and modified flow patterns at the OCS–DC; the effects of altered local hydrodynamic patterns around turbine		

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			foundations; the broad scale effects of wind wakes on hydrodynamic patterns and larvae that extend beyond the footprint of the Project; and the effects of operational noise on larvae.		
42	C, O&M, D	Containments	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.	EFH	BOEM, USACE
43	C, O&M, D	Anti-corrosion protections	Any anti-corrosion protection methods or systems proposed should be identified. If sacrificial anodes are used, Al anodes should be selected over Zn anodes. 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.	EFH	BOEM
44	D	Plan prior to decommissioning	The EFH consultation should be reinitiated prior to decommissioning turbines to ensure that the impact to EFH as a result of the decommissioning activities have been fully evaluated and minimized to the extent practicable. Pre-consultation coordination related to decommissioning should occur at least 5 years prior to the proposed decommissioning.	EFH	BOEM
NMFS Fish and Wildlife Coordination Act Recommendations dated September 14, 2023					
1	C	Time of year restrictions	No in-water work should occur between May 15 to July 15 of any calendar year to avoid and minimize potential impacts to horseshoe crabs spawning along the Long Island beaches including the Fire Island National Seashore.	Horseshoe crabs	USACE, NMFS
2	C, O&M, D	NOAA surveys	The Project should be required to mitigate the major impacts to NOAA Fisheries scientific surveys consistent with NOAA Fisheries-BOEM Federal Survey Mitigation Strategy - Northeast U.S. Region. Sunrise Wind's plans to mitigate these impacts at the Project and regional levels should be provided to NOAA Fisheries for review and approval prior to BOEM's decision on its	NOAA fisheries	USACE, NMFS

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			acceptance. Mitigation is necessary to ensure that NOAA Fisheries can continue to accurately, precisely, and timely execute our responsibilities to monitor the status and health of trust resources.		
3	C	Potential gear obstructions	Locations of relocated boulders, created berms, and scour protection, including cable protection measures (i.e., concrete mattresses) should be provided to NOAA Fisheries, all other federal agencies with maritime jurisdiction, and the public as soon as possible to help inform all interested parties of potential gear obstructions.	EFH	USACE, NMFS
4	C, O&M, D	Sampling	Ichthyoplankton and zooplankton samples collected as part of the Biological Monitoring outlined in the NPDES Permit should be provided to NOAA Fisheries NEFSC to cross-verify samples for incorporation into the Ecosystem Monitoring Program plankton dataset.	Ichthyo-plankton, zooplank-ton	USACE, NMFS
BOEM proposed Mitigation and Monitoring Measures in the NMFS BA					
1	C	Pile driving SFV plan	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. 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 ft (750 m) 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	Marine mammals and sea turtles	BOEM, BSEE, and NMFS

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			energy rating, 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. 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 T&Cs directing action should SFV-measured ranges exceed those authorized. See Chapter 3 of BOEM's *Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans* for more information. 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 submission of raw acoustic data or data products associated with SFV to BOEM may be required. The Lessee must follow the approved plan. 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		

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			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.		
2	C	Long-term passive acoustic monitoring (PAM)	Highly migratory species like baleen whales occupy different parts of the Atlantic OCS at different times of the year. PAM is an effective tool to monitor baleen whale habitat use, because it can detect the presence of whales when other methods are not feasible, such as periods of low visibility, poor weather, or when animals are far below the ocean's surface. 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. 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	Marine mammals	BOEM, BSEE, NMFS

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			data collected throughout the broader region, thus supporting cumulative effects analysis for highly migratory species. 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 vocalizing baleen whales could be detected, based on the assumption of a 10 km 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. 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 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 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		

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			Lessee may request a temporary embargo on the public release of acoustic data that has been collected within the Project Area.		
3	All fisheries surveys	Lost survey gear	All reasonable efforts that do not compromise human safety must be undertaken to recover any lost survey gear. Any lost gear must be reported to NMFS (nmfs.gar.incidental-take@noaa.gov) and BSEE (OSWsubmittals@bsee.gov) within 24 hours after the gear is documented as missing or lost. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.	ESA-listed fish, marine mammals, sea turtles	BOEM, BSEE and NMFS
4	All fisheries surveys	Sea turtle/Atlantic sturgeon identification and data collection	Any sea turtles or Atlantic sturgeon caught or retrieved in any fisheries survey gear must first be identified to species or species group. Each ESA-listed species caught or retrieved must then be documented using appropriate equipment and data collection forms. Biological data collection, sample collection, and tagging activities must be conducted as outlined below. Live, uninjured animals must be returned to the water as quickly as possible after completing the required handling and documentation. a. The Sturgeon and Sea Turtle Take Standard Operating Procedures must be followed (https://media.fisheries.noaa.gov/2021-11/Sturgeon%20%26%20Sea%20Turtle%20Take%20SOPs_external_11032021.pdf). b. Survey vessels must have a passive integrated transponder (PIT) tag reader onboard capable of reading 134.2 kilohertz (kHz) and 125 kHz encrypted tags (e.g., Biomark Global Pocket Reader Plus Handheld PIT Tag Reader). This reader must be used to scan any captured sea turtles and sturgeon for tags, and any tags found must be recorded on the take reporting form (see below). c. Genetic samples must be taken from all captured Atlantic sturgeon (alive or dead) to allow for identification of the DPS of origin of captured individuals and tracking of the amount of incidental take. This must be done in	ESA-listed fish, sea turtles	BOEM. BSEE, and NMFS

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			accordance with the Procedures for Obtaining Sturgeon Fin Clips (https://media.fisheries.noaa.gov/dam-migration/sturgeon_genetics_sampling_revised_june_2019.pdf). i. Fin clips must be sent to a NMFS-approved laboratory capable of performing genetic analysis and assignment to DPS of origin. Sunrise must cover all reasonable costs of the genetic analysis. Arrangements for shipping and analysis must be made before samples are submitted and confirmed in writing to NMFS within 60 days of the receipt of the Project Biological Opinion with ITS. Results of genetic analyses, including assigned DPS of origin must be submitted to NMFS within 6 months of the sample collection. ii. Subsamples of all fin clips and accompanying metadata forms must 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-takereporting-programmatics-greater-atlantic. d. All captured sea turtles and Atlantic sturgeon must be documented with required measurements and photographs. The animal's condition and any marks or injuries must be described. This information must be entered as part of the record for each incidental take. Particularly, a NMFS Take Report Form must be filled out for each individual sturgeon and sea turtle (download at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%Form%2007162021.pdf?null) and submitted to NMFS as described in the take notification measure below.		

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5	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 must be handled and resuscitated (if unresponsive) according to established protocols provided at-sea conditions are safe for those handling and resuscitating the animal(s) to do so. Specifically, a. Priority must be given to the handling and resuscitation of any sea turtles or sturgeon that are captured in the gear being used. Handling times for these species must be minimized, and if possible, kept to 15 minutes or less to limit the amount of stress placed on the animals. b. All survey vessels must have onboard copies of the sea turtle handling and resuscitation requirements (found at 50 *CFR* § 223.206(d)(1)) before beginning any on-water activity (download at: https://media.fisheries.noaa.gov/dam-migration/sea_turtle_handling_and_resuscitation_measures.pdf). These handling and resuscitation procedures must be carried out any time a sea turtle is incidentally captured and brought onboard the vessel during survey activities. c. If any sea turtles that appear injured, sick, or distressed, are caught and retrieved in fisheries survey gear, survey staff must 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 survey staff are unable to contact the hotline (e.g., due to distance from shore or lack of ability to communicate via phone), the USCG must be contacted via very high frequency (VHF) marine radio on USCG Channel 16. If required, hard-shelled sea turtles (i.e., non-leatherbacks) may be held on board for up to 24 hours and managed in accordance with handling instructions provided by the hotline before transfer to a rehabilitation facility.	ESA-listed fish, sea turtles	BOEM, BSEE, and NMFS

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			d. Survey staff must attempt 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). e. If appropriate cold storage facilities are available on the survey vessel, any dead sea turtle or Atlantic sturgeon must be retained on board the survey vessel for transfer to an appropriately permitted partner or facility on shore unless NMFS indicates that storage is unnecessary or storage is not safe. f. Any live sea turtles or Atlantic sturgeon caught and retrieved in gear used in any fisheries survey must ultimately be released according to established protocols including safety considerations.		
6	All fisheries surveys	Take notification	GARFO PRD must 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, a. GARFO PRD must be notified within 24 hours of any interaction with a sea turtle or sturgeon (nmfs.gar.incidental-take@noaa.gov). The report will 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 email will 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	ESA-listed fish, sea turtles	BOEM, BSEE, and NMFS

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			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 must be submitted as soon as possible; late reports must be submitted with an explanation for the delay. b. At the end of each survey season, a report must be sent to NMFS that compiles all information on any observations and interactions with ESA-listed species. This report will 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 must be comprehensive of all activities, regardless of whether ESA-listed species were observed.		
7	C	PSO coverage	BOEM, BSEE, and USACE will ensure that PSO coverage is sufficient to reliably detect whales and sea turtles at the surface in clearance and shutdown zones so that Sunrise can execute any pile driving delays or shutdown requirements. If, at any point before or during construction, the PSO coverage that is included by Sunrise 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 or platforms will be deployed. Determinations prior to construction will be based on review of the Pile Driving Monitoring Plan before construction begins. Determinations during construction will be based on review of the weekly pile driving reports and other information, as appropriate	Sea turtles, marine mammals	BOEM, BSEE, USACE, and NMFS
8	C	Soft tarts for sea turtles and sturgeon	The Lessee must implement soft-start techniques for pile driving. For impact pile driving, the soft start must include a minimum of 20 minutes of 4-6 strikes/minute at 10-20 percent of the maximum hammer energy. Soft start is required at the beginning of driving a new pile and at any time following the cessation of impact pile driving for 30 minutes or longer.	ESA-listed fish and sea turtles	BOEM, BSEE, and NMFS

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9	C	Sea turtle clearance zones	The visual clearance zone must be clear of sea turtles for 30 minutes before the activity (e.g., pile driving) can begin. Monitoring must begin 60 minutes before the start of the activity (at least 30 minutes prior to clearance requirements). Any visual detection of sea turtles within the clearance zone during the 30 minutes prior to activity will trigger a delay or repeated in the monitoring of the Clearance Zone. If there is a visual detection of a sea turtle entering or within the clearance zone the Lessee must delay the pile driving activities from the time of the observation, until: 1) The lead PSO verifies that the animal(s) voluntarily left and headed away from the clearance zone; or 2) 30 minutes have elapsed without redetection of the animal(s) by the lead PSO. For ESA-listed whales: refer to Proponent's ITA Application, as may be modified by BOEM.	Sea turtles	BOEM, BSEE, and NMFS
10	C	Sea turtle shutdown zones	For sea turtles: To ensure that impact pile driving operations are carried out in a way that minimizes the exposure of listed sea turtles to noise that may result in injury, based on the modeling results for each pile type and reasonableness at detection sea turtles. For sea turtles: To ensure that pile driving operations are carried out in a way that minimizes the exposure of listed sea turtles to noise that may result in injury, PSOs will monitor the established 500-m (1,640-ft) shutdown zone for all pile driving activities (500 m has been used previously).	Sea turtles	BOEM, BSEE, and NMFS
11	C	Monitoring zones for sea turtles	To ensure that any "take" is documented, BOEM, BSEE, and USACE will require Sunrise Wind to monitor and record all observations of ESA-listed sea turtles over the full extent of any area where noise may exceed 175 dB rms during any pile driving activities and for 30 minutes following the cessation of pile driving activities	Sea turtles	BOEM, BSEE, and NMFS

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12	C	Nighttime monitoring plan for impact pile driving	Sunrise Wind 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 clearance and shutdown zones. Sunrise Wind must submit an Alternative Monitoring Plan (AMP) to BOEM and NMFS for review and approval at least 180 days prior to the planned start of pile-driving. This plan may include deploying additional observers, alternative monitoring technologies such as night vision, thermal, and infrared technologies, or use of PAM and must demonstrate the ability and effectiveness of the proposed equipment and methods to monitor clearance and shutdown zones. The AMP must address daytime conditions when lighting or weather (e.g., fog, rain, sea state) conditions prevent effective visual monitoring of clearance and shutdown zones, and nighttime condition (if permitted), daytime being defined as one hour after civil sunrise to 1.5 hours before civil sunset. The lead PSO will determine as to when there is sufficient light to ensure effective visual monitoring can be accomplished in all directions and when the Alternative Monitoring Plan will be implemented. If a marine mammal or sea turtle is observed entering or found within the shutdown zones after impact pile-driving has commenced, Sunrise must follow the shutdown procedures outlined in the *Protected Species Mitigation Monitoring Plan*. Sunrise must 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. The AMP must include, but is not limited to the following information: • Identification of night vision devices, such as mounted thermal or infrared (IR) camera systems, handheld or wearable NVDs, and IR spotlights, if proposed for use to detect marine mammals and sea turtles. • The AMP must demonstrate the capability of the proposed monitoring methodology to detect sea turtles within the clearance and shutdown	Sea turtles, marine mammals	BOEM, BSEE, and NMFS

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			zones. Only devices and methods demonstrated as being effective in detecting marine mammals and sea turtles within the clearance and shutdown zones will be acceptable. • Evidence and discussion of the efficacy (range and accuracy) of each device proposed for low visibility monitoring must include an assessment of the results of field studies, as well as supporting documentation regarding the efficacy of all proposed alternative monitoring methods (e.g., best scientific data available). • Reporting procedures, contacts and timeframes. • BOEM may request additional information, when appropriate, to assess the efficacy of the AMP.		
13	C, O&M	Pile driving PAM Plan	BOEM, BSEE, and USACE will require Sunrise to prepare a detailed PAM Plan that describes all proposed PAM equipment (including sensitivity and detection range); procedures, and protocols (if new systems are proposed proof of concept materials should be provided); a description of the PAM hardware and software used for marine mammal monitoring (including software version) (if new systems are proposed proof of concept materials should be provided); calibration data, bandwidth capability and sensitivity of hydrophone(s); and any filters planned for use in hardware or software, and known limitations of the equipment, and deployment locations, procedures, detection review methodology, and protocols. This plan must be submitted to NMFS (at nmfs.gar.incidental-take@noaa.gov), BOEM (at renewable_reporting@boem.gov), and BSEE (at OSWsubmittals@bsee.gov) for review and concurrence at least 180 days prior to the planned start of PAM activities. BOEM will review the PAM Plan and provide comments, if any, on the plan within 45 calendar days, but no later than 90 days after it is submitted. Sunrise must resolve all comments on the PAM Plan to BOEM's satisfaction before	Sea turtles, marine mammals	BOEM, BSEE, USACE, and NMFS

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			implementation of the plan. If BOEM does not provide comments on the PAM Plan within 90 calendar days of its submittal, Sunrise may conclude that BOEM has concurred with the PAM Plan.		
14	C	Modification of clearance and exclusion zones	BOEM, BSEE, and USACE may reduce, upon request, shutdown zones for ESA-listed sei, fin, or sperm whales based upon SFV of a minimum of three piles; however, the shutdown zone for sei, fin, and sperm whales will not be reduced to less than 1,000 m, or less than 500 m (1,640 ft) for ESA-listed sea turtles. The clearance or shutdown zones for NARWs will not be reduced regardless of the results of SFV of a minimum of three piles.	Sea turtles, marine mammals	BOEM, BSEE, USACE, and NMFS
15		Monthly/ Annual reporting requirements	Sunrise must implement the following reporting requirements to document the amount or extent of take that occurs during all phases of the Proposed Action: a. All reports must be sent to: NMFS at nmfs.gar.incidental-take@noaa.gov and BSEE at OSWsubmittals@bsee.gov. b. During the construction phase and for the first year of operations, Sunrise must compile and submit monthly reports summarizing all Project activities carried out in the previous month, including vessel transits (number, type of vessel, and route), piles installed, and all observations of ESA-listed species. Monthly reports are due on the 15th of the month for the previous month. c. Beginning in Year 2 of operations, Sunrise must compile and submit annual reports that summarize 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 fish, marine mammals, sea turtles	BOEM and NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
16	C, O&M, D	Geophysical and geotechnical Surveys	Sunrise must comply with all the Project Design Criteria and Best Management Practices for Protected Species at https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf that implement the integrated requirements for threatened and endangered species in the June 29, 2021, programmatic consultation under the ESA, revised November 22, 2021.	Sea turtles, marine mammals	BOEM and NMFS
17	O&M	Periodic underwater surveys, reporting of monofilament and other fishing gear around WTG foundations	Sunrise must monitor potential loss of fishing gear in the vicinity of WTG foundations by surveying at least 10 different WTGs in the Project Area annually. Survey design and effort may be modified based upon previous survey results after review and concurrence by BOEM. Sunrise must conduct surveys by remotely operated vehicles, divers, or other means to determine the locations and amounts of marine debris. Sunrise 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.	Sea turtles, marine mammals	BOEM, BSEE
18	C, O&M	Gear identification	To facilitate identification of gear on any entangled animals, all trap/pot gear used in any Project survey must be uniquely marked to distinguish it from other commercial or recreational gear. Gear must be marked with a 3-foot-long strip of black and white duct tape within two fathoms of a buoy	Marine mammals, sea turtles	BOEM and NMFS

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			attachment. In addition, three additional marks must be placed on the top, middle and bottom of the line using black and white paint or duct tape. No variation from these marking requirements may be made without notification and approval from NMFS.		
19	C, O&M	Sea turtle disentangle-ment	Vessels deploying fixed gear (e.g., pots/traps) must have adequate disentanglement equipment onboard, such as a knife and boathook. Any disentanglement must occur consistent with the Northeast Atlantic Coast STDN Disentanglement Guidelines at https://www.reginfo.gov/public/do/DownloadDocument?objectID=102486501 and the 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).	Sea turtles	BOEM and NMFS
20	Pre-C, C, O&M, D	Marine debris awareness and elimination	**Marine Debris Awareness Training.** The Lessee must 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 will 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 will include the following elements: • Viewing of either a video or slide show by the personnel specified above;	ESA-listed fish, marine mammals, sea turtles, commercial and recrea-tional fishing, finfish	BOEM, BSEE, and NMFS

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			• An explanation from management personnel that emphasizes their commitment to the requirements; • Attendance measures (initial and annual); and • Recordkeeping and the availability of records for inspection by United States Department of Interior (DOI). Training Compliance Report. By January 31 of each year, the Lessee must 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 must send the reports via email to BOEM (at renewable_reporting@boem.gov) and to BSEE (at marinedebris@bsee.gov). **Marking.** Materials, equipment, tools, containers, and other items used in OCS activities, which are of such shape or configuration that make them likely to snag or damage fishing devices or be lost or discarded overboard, must be clearly marked with the vessel or facility identification number, and properly secured to prevent loss overboard. All markings must clearly identify the owner and must be durable enough to resist the effects of the environmental conditions to which they may be exposed. **Recovery and Prevention** The Lessee must recover marine trash and debris that is lost or discarded in the marine environment while performing OCS activities when such incident is likely to (1) cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components, which particular attention to marine trash or debris that could entangle or be ingested by marine protected species; or (2) significantly interfere with OCS uses (e.g., the marine trash or debris is likely to damage fishing equipment, or present a hazard to navigation). The Lessee must notify DOI within 48 hours of the incident (using		

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			the email address listed on the DOI's most recent incident reporting guidance) if recovery activities are (a) not possible because conditions are unsafe; or (b) not practicable or not warranted because the marine trash and debris released is not likely to result in any of the conditions listed in (1) or (2) above. Notwithstanding this notification, DOI may still order the Lessee to recover the lost or discarded marine trash and debris if DOI finds the reasons provided by the Lessee in the notification unpersuasive. If the marine trash and debris is located within the boundaries of a potential archaeological resource/avoidance area, or a sensitive ecological/benthic resource area, the Lessee must contact DOI for concurrence before conducting any recovery efforts. Recovery of the marine trash and debris should be completed as soon as practicable, but no later than 30 calendar days from the date on which the incident occurred. If the Lessee is not able to recover the marine trash or debris within 48 hours of the incident, the Lessee must submit a plan to DOI explaining the activities planned to recover the marine trash or debris (Recovery Plan). The Lessee must submit the Recovery Plan no later than 10 calendar days from the date on which the incident occurred. Unless DOI objects within 48 hours of the filing of the Recovery Plan, the Lessee can process with the activities described in the Recovery Plan. The Lessee must request and obtain a time extension if recovery activities cannot be completed within 30 calendar days from the date on which the incident occurred. The Lessee must enact steps to prevent similar incidents and must submit a description of these actions to BOEM and BSEE within 30 calendar days from the date on which the incident occurred. **Reporting** The Lessee must report to DOI (using the email address listed on DOI's most recent incident reporting guidance) all lost or discarded marine trash and debris. This report must be made monthly and submitted no later than the fifth day of the following month. The Lessee is not required to submit a report		

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			for those months in which no marine trash and debris was lost or discarded. The report must include the following: • Project identification and contact information for the Lessee and for any operators or contractors involved; • The date and time of the incident; • The lease number, OCS area and block, and coordinates of the object's location (latitude and longitude in decimal degrees); • A detailed description of the dropped object, including dimensions (approximate length, width, height, and weight) and composition (e.g., plastic, aluminum, steel, wood, paper, hazardous substances, or defined pollutants); • Pictures, data imagery, data streams, and/or a schematic/illustration of the object, if available; • An indication of whether the lost or discarded item could be detected as a magnetic anomaly of greater than 50 nanotesla, a seafloor target of greater than 1.6 ft (0.5 m), or a sub-bottom anomaly of greater than 1.6 ft (0.5 m) when operating a magnetometer or gradiometer, side scan sonar, or sub-bottom profiler in accordance with DOI's most recent, applicable guidance; • An explanation of the how the object was lost; and • A description of immediate recovery efforts and results, including photos. In addition to the foregoing, the Lessee must submit a report within 48 hours of the incident (48 Hour Report) if the marine trash or debris could (1) cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components, which particular attention to marine trash or debris that could entangle or be ingested by marine protected species; or (2) significantly interfere with OCS uses (e.g., the marine trash or debris is likely to damage fishing equipment or present a hazard to navigation). The information in the 48 Hour Report must be the same as that listed for the		

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			monthly report, but only for the incident that triggered the 48 Hour Report. The Lessee must report to DOI (using the email address listed on DOI's most recent incident reporting guidance) if the object is recovered and, as applicable, describe any substantial variance from the activities described in the Recovery Plan that were required during the recovery efforts. The Lessee must include and address information on unrecovered marine trash and debris in the description of the site clearance activities provided in the decommissioning application required under 30 *CFR* § 585.906. **Option to Comply with Most Current Non-Required Measures** The Lessee may opt to comply with the most current non-required measures (e.g., measures in a programmatic consultation that are not binding on the Lessee) related to protected species and habitat in place at the time an activity is undertaken under the lease. At least 30 calendar days prior to undertaking an activity, the Lessee must notify DOI of its intention to comply with such measures in lieu of those required under the T&Cs above. DOI reserves the right to object or request additional information on how the Lessee intends to comply with such measures. If DOI does not respond with objections within 15 calendar days of receipt of the Lessee's notification, then the Lessee may conclude the DOI has concurred.		
21	Pre-C, C, O&M, D	Look out for sea turtles during vessel operations	a. For all vessels operating north of the Virginia/North Carolina border, between June 1 and November 30, Sunrise must have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles. The trained lookout must communicate any sightings, in real time, to the captain so that the requirements in (e) below can be implemented. b. For all vessels operating south of the Virginia/North Carolina border, year-round (reflecting year-round sea turtle presence), Sunrise must have a trained lookout posted on all vessel transits during all phases of the Project	Sea turtles	BORM and NMFS

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			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. c. The trained lookout will review https://seaturtlesightings.org/ before each trip and report any observations of sea turtles in the vicinity of the planned transit to all vessel operators or captains and lookouts on duty that day. d. The trained lookout will maintain a vigilant watch and monitor a 500-m Vessel Strike Avoidance Zone at all times to maintain this minimum separation distance between the vessel and ESA-listed sea turtle species. Alternative monitoring technology, such as night vision and thermal cameras, will be available to ensure effective watch at night and in any other low visibility conditions. If the trained lookout is a vessel crew member, lookout will be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts will receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. e. If a sea turtle is sighted within 100 m (328 ft) or less of the operating vessel's forward path, the vessel operator must slow down to 4 knots (unless unsafe to do so) and then proceed away from the turtle at a speed of 4 knots or less until there is a separation distance of at least 100 m (328 ft) between the vessel and the sea turtle at which time the vessel may resume normal operations. If a sea turtle is sighted within 50 m (164 ft) of the forward path of the operating vessel, the vessel operator must shift to neutral when safe to do so and then proceed away from the turtle at a speed of 4 knots. The vessel may resume normal operations once it has passed the turtle. f. Vessel captains or operators must avoid transiting through areas of visible jellyfish aggregations or floating sargassum lines or mats. If operational		

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			safety precludes avoiding such areas, vessels must slow to 4 knots when transiting. g. All vessel crew members must be briefed on identification of sea turtles, applicable regulations, and best practices for avoiding vessel collisions with sea turtles. Reference materials for identification of sea turtles must be available aboard all Project vessels. The requirement and process for reporting sea turtles (including live, entangled, and dead individuals) must be clearly communicated, including posting in highly visible locations aboard all Project vessels. This communication must clearly convey that sea turtle observations are to be reported to the designated vessel contact (such as the lookout or the vessel captain) and provide a communication channel and process for crew members to do so. h. If a vessel is carrying a PSO or trained lookout for the purposes of maintaining watch for NARWs, an additional lookout is not required so long as the PSO or trained lookout maintains watch for both whales and sea turtles. i. 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 100 m (328 ft) avoidance measure. j. Exceptions to the requirements of this mitigation measure (Look out for sea turtles and reporting) are allowed only if the safety of the vessel or crew necessitates deviation from the requirements on an emergency basis. Any such exceptions must be reported to NMFS and BSEE within 24 hours after they occur.		
22	Pre-C, C, O&M, D	Data collection BA BMPs	BOEM will ensure that all Project Design Criteria and Best Management Practices incorporated in the Atlantic Data Collection consultation for Offshore Wind Activities (June 2021) shall be applied to activities associated with the	ESA-listed fish, marine	BOEM

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			construction, maintenance, and operations of the Sunrise Wind Project, as applicable.	mammals, sea turtles	
23	Pre-C, C, O&M, D	Minimize vessel interactions with listed species consistent with HRG programmatic plan	All vessels associated with survey activities (transiting [i.e., traveling between a port and the survey site] or actively surveying) must comply with the vessel strike avoidance measures specified below. The only exception is when the safety of the vessel or crew necessitates deviation from these requirements. • If any ESA-listed marine mammal is sighted within 500 m (1,640 ft) of the forward path of a vessel, the vessel operator must steer a course away from the whale at less than 10 knots (18.5 km/hour) until the minimum separation distance has been established. Vessels may also shift to idle if feasible. • If any ESA-listed marine mammal is sighted within 200 m 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 500 m (1,640 ft). If stationary, the vessel must not engage engines until the large whale has moved beyond 500 m (1,640 ft). • 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 operations once the vessel has passed the sea turtle or manta ray.	ESA-listed fish, marine mammals, sea turtles	BOEM and NMFS
24	Pre-C, C, O&M, D	Survey training	For any vessel trips where gear is set or hauled for trawl or ventless trap surveys, at least one of the survey staff onboard must have completed NEFOP observer training within the last 5 years or completed other equivalent 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 must be	ESA-listed fish	BOEM and NMFS

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			available on board each survey vessel. Sunrise must prepare a training plan that addresses how these survey requirements will be met and must submit that plan to NMFS in advance of any trawl or trap surveys.		
25	C, O&M, D	Vessel crew and visual observer training requirements	The Lessee must provide Project-specific training to all vessel crew members, visual observers, and trained lookouts on the identification of sea turtles and marine mammals, vessel strike avoidance and reporting protocols, and the associated regulations for avoiding vessel collisions with protected species. Reference materials for identifying sea turtles and marine mammals must be available aboard all Project vessels. Confirmation of the training and understanding of the requirements must be documented on a training course log sheet, and the Lessee must provide the log sheets to DOI upon request. The Lessee must communicate to all crew members its expectation for them to report sightings of sea turtles and marine mammals to the designated vessel contacts. The Lessee must communicate the process for reporting sea turtles and marine mammals (including live, entangled, and dead individuals) to the designated vessel contact and all crew members. The Lessee must post the reporting instructions, including communication channels, in highly visible locations aboard all Project vessels.	Marine mammals, sea turtles	BOEM and NMFS
26	C, O&M, D	Vessel observer requirements	The Lessee must ensure that vessel operators and crew members maintain a vigilant watch for marine mammals and sea turtles, and reduce vessel speed, alter the vessel's course, or stop the vessel as necessary to avoid striking marine mammals or sea turtles. All vessels transiting to and from the SRWF must have a trained lookout for NARWs on duty at all times, during which the trained lookout must monitor a vessel strike avoidance zone around the vessel. The trained lookout must maintain a vigilant watch at all times a vessel is underway and, when technically feasible, monitor the 500-m Vessel Strike Avoidance Zone for ESA-listed species to maintain minimum separation distances. Alternative monitoring technology (e.g., night vision, thermal	Marine mammals, sea turtles	BOEM and NMFS

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			cameras, etc.) must be available to maintain a vigilant watch at night and in any other low visibility conditions. If a vessel is carrying a trained lookout for the purposes of maintaining watch for NARWs, an additional trained lookout for sea turtles is not required, provided that the trained lookout maintains watch for marine mammals and sea turtles. If the trained lookout is a vessel crew member, the lookout obligations as noted above must be that person's designated role and primary responsibility while the vessel is transiting. Vessel personnel must be provided an Atlantic reference guide to help identify marine mammals and sea turtles that may be encountered. Vessel personnel must also be provided material regarding NARW seasonal management areas (SMAs), dynamic management areas (DMAs), visually triggered Slow Zones, sightings information, and reporting. All observations must be recorded per reporting requirements. Outside of active watch duty, members of the monitoring team must check NMFS's NARW sightings for the presence of NARWs in the SRWF. The trained lookout must check the Sea Turtle Sighting Hotline30 before each trip and report any detections of sea turtles in the vicinity of the planned transit to all vessel operators or captains and lookouts on duty that day. For all vessels operating north of the Virginia/North Carolina border, the Lessee must have a trained lookout posted between June 1 and November 30 on all vessel transits during all phases of the Project to observe for sea turtles. For all vessels operating south of the Virginia/North Carolina border, the Lessee must have a trained lookout posted year-round on all vessel transits during all phases of the Project to observe for sea turtles. The trained lookout must communicate any sightings in real time to the captain to implement required avoidance measures		
27	Pre-C, C, O&M, D	Vessel communication of threatened or endangered	The Lessee must ensure that whenever multiple Project vessels are operating, any visual detections of ESA-listed species (marine mammals and sea turtles) are communicated in near real time to these personnel on the other Project vessels: a third-party PSO, vessel captains, or both.	Marine mammals, sea turtles	BOEM and NMFS

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		(T&E) species sightings			
28	C, O&M, D	Vessel speed requirements	During construction, vessels of all sizes must operate at 10 knots or less between November 1 and April 30 and while operating port to port and operating in the Lease Area, along the export cable route, or in the transit area to and from ports in New York, Connecticut, Rhode Island, and Massachusetts. Regardless of vessel size, vessel operators must reduce vessel speed to 10 knots (11.5 miles per hour [mph]) or less while operating in any SMA (https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-northatlantic-right-whales) or DMA/visually detected Slow Zones. This requirement does not apply when necessary for the safety of the vessel or crew. Any such events must be reported. These speed limits do not apply in areas of Narragansett Bay or Long Island Sound, where the presence of NARWs is not expected. All vessel operators must check for information regarding mandatory or voluntary ship strike avoidance and daily information regarding NARW sighting locations. These media may include, but are not limited to, the following: NOAA weather radio, Coast Guard NAVTEX and Channel 16 broadcasts, Notices to Mariners, Whale Alert app (http://www.whalealert.org/), WhaleMap website (https://whalemap.ocean.dal.ca/), NARW Sighting Advisory System (https://apps-nefsc.fisheries.noaa.gov/psb/surveys/MapperiframeWithText.html), or information on active SMAs and Slow Zones. (https://www.fisheries.noaa.gov/national/endangered-speciesconservation/reducing-vessel-strikes-north-atlantic-right-whales) The Lessee may only request a waiver from any visually triggered Slow Zone or DMA vessel speed reduction requirements during operations and maintenance by submitting a vessel strike risk reduction plan that details revised measures and an analysis demonstrating that the measure(s) will provide a level of risk	Marine mammals, sea turtles	BOEM and NMFS

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			reduction at least equivalent to the vessel speed reduction measure(s) proposed for replacement. The plan included with the request must be provided to NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division and BOEM at least 90 days prior to the date scheduled for the activities for which the waiver is e Description Project Phase Purpose requested. The plan must not be implemented unless NMFS and BOEM reach consensus on the appropriateness of the plan. BOEM encourages increased vigilance through voluntary implementation of best management practices to minimize vessel interactions with NARWs, by voluntarily reducing speeds to 10 knots or less when operating within an acoustically triggered Slow Zone, and, when feasible, by avoiding Slow Zones. Regardless of vessel size, the vessel captain and crew must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as appropriate, to avoid striking any listed species. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised upon the sighting of a single individual. If pinnipeds or small delphinids of the genera Delphinus, Lagenorhynchus, Stenella, or Tursiops are visually detected approaching the vessel (i.e., to bow ride) or towed equipment, vessel speed reduction, course alteration, and shutdown are not required. Vessels underway must not divert their course to approach any protected species. If an ESA-listed whale or large unidentified whale is identified within 1,640 ft (500 m) of the forward path of any vessel (90 degrees port to 90 degrees starboard), the vessel operator must immediately implement strike avoidance measures and steer a course away from the whale at 10 knots (18.5 km/hour) or less until the vessel reaches a 1,640-ft (500-m) separation distance from the whale. If a whale is observed but cannot be confirmed as a species other than a NARW, the vessel operator must assume that it is an NARW and execute the required vessel strike avoidance measures to avoid the animal. Trained lookouts, visual observers, vessel crew,		

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			or PSOs must notify the vessel captain of any whale observed or detected within 1,640 ft (500 m) of the survey vessel. Upon notification, the vessel captain must immediately implement vessel strike avoidance procedures to maintain a separation distance of 1,640 ft (500 m) or reduce vessel speed to allow the animal to travel away from the vessel. If an ESA-listed large whale is sighted within 656 ft (200 m) of the forward path of a vessel, the vessel operator must initiate a full stop by reducing 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 1,640 ft (500 m). If stationary, the vessel must not engage engines until the ESA-listed large whale has moved beyond 1,640 ft (500 m).		
29	C, O&M, D	Vessel strike avoidance of small cetaceans and seals	For small cetaceans and seals, all vessels must maintain a minimum separation distance of 164 ft (50 m) to the maximum extent practicable, except when those animals voluntarily approach the vessel. When marine mammals are sighted while a vessel is underway, the vessel operator must endeavor to avoid violating the 164-ft (50-m) separation distance by attempting to remain parallel to the animal's course and avoiding excessive speed or abrupt changes in vessel direction until the animal has left the area, except when taking such measures would threaten the safety of the vessel or crew. If marine mammals are sighted within the 164-ft (50-m) separation distance, the vessel operator must reduce vessel speed and shift the engine to neutral, not engaging the engines until animals are beyond 164 ft (50 m) from the vessel.	Marine mammals	BOEM and NMFS
30	C, O&M, D	Vessel strike avoidance of sea turtles	The Lessee must slow down to 4 knots if a sea turtle is sighted within 328 ft (100 m) of the operating vessel's forward path. The vessel operator must then proceed away from the turtle at a speed of 4 knots or less until there is a separation distance of at least 328 ft (100 m), at which time the vessel may resume normal operations. If a sea turtle is sighted within 164 ft (50 m) of the forward path of the operating vessel, the vessel operator must shift to neutral	Sea turtles	BOEM and NMFS

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			when safe to do so and then proceed away from the individual at a speed of 4 knots or less until there is a separation distance of at least 328 ft (100 m), at which time normal vessel operations may be resumed. Between June 1 and November 30, all vessels must avoid transiting through areas of visible jellyfish aggregations or floating vegetation (e.g., sargassum lines or mats). In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas. Year-round, vessels operating south of the Virginia/North Carolina border must avoid transiting through areas of visible jellyfish aggregations or floating vegetation (e.g., sargassum lines or mats). In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas. The only exception to all the above requirements is when the safety of the vessel or crew necessitates deviation from these requirements. If any such incidents occur, they must be reported (see reporting requirements). All vessel crew members must be briefed on the identification of sea turtles and on regulations and best practices for avoiding vessel collisions. Reference materials must 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) must 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 so report.		
31	Pre-C, C, O&M, D	Reporting of NARW sightings	The Lessee must immediately report all NARWs observed at any time by PSOs or vessel personnel on any Project vessels during any Project-related activity or during vessel transit. Reports must be submitted to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov); the NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622); the Coast Guard (via telephone at (617) 223-5757 or via Channel 16); and	Marine mammals	BOEM and NMFS

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			WhaleAlert (http://www.whalealert.org/). The report must include the time, location, and number of animals sighted.		
32	Pre-C, C, O&M, D	Detected or impacted protected species reporting	The Lessee is responsible for reporting dead or injured protected species, regardless of whether they were observed during operations or due to Project activities. The Lessee must report any potential take, strikes, dead, or injured protected species caused by Project vessels or sighting of an injured or dead marine mammal or sea turtle, regardless of the cause, to the NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division (at nmfs.gar.incidental-take@noaa.gov), NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622), BOEM (at renewable_reporting@boem.gov), and BSEE (at OSWSubmittals@bsee.gov). The Detected or Impacted Protected Species Report must be submitted as soon as practicable but no later than 24 hours from the time the incident took place. Staff responding to the hotline call will provide any instructions for the handling or disposing of any injured or dead protected species by individuals authorized to collect, possess, and transport sea turtles. The Detected or Impacted Protected Species Report must include the following information: • Time, date, and location (latitude and longitude) of the first discovery of the animal or animals and updated location information (if known) and applicable; • Species identification (if known) or a description of the animals involved; • Condition of the animals (including carcass condition if the animal is dead); • Observed behaviors of the animals, if alive; • If available, photographs or video footage of the animals; and • General circumstances under which the animal or animals were discovered. In the event of a vessel strike of a protected species by any survey vessel, the Lessee must immediately report the incident to BOEM (at	ESA-listed fish, marine mammals, sea turtles	BOEM and NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-2 Description of Mitigation and Monitoring Measures Resulting from Consultations	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			renewable_reporting@boem.gov) and NMFS (at nmfs.gar.incidental-take@noaa.gov), and the NOAA Stranding Hotline (866-755-6622). The Protected Species Incident Report must include the following information: • Time, date, and location (latitude and longitude) of the incident; • Species identification (if known) or description of the animals involved; • Lessee and vessel information; • Vessel's speed during and leading up to the incident; • Vessel's course or heading and what operations were being conducted (if applicable); • Status of all sound sources in use (if applicable); • Description of avoidance measures or requirements in place at the time of the strike and what additional measures were taken, if any, to avoid the strike; • Environmental conditions (e.g., wind speed and direction, Beaufort scale, cloud cover, visibility) immediately preceding the strike; • Estimated size and length of animal or animals struck; • Description of the behavior of the animals immediately preceding and following the strike; • Estimated fate of the animal or animals (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and • To the extent practicable, photographs or video footage of the animals.		
33	Pre-C, C, O&M, D	Detected or impacted dead non ESA-listed fish reporting	Any occurrence of at least 10 dead non-ESA-listed fish within established shutdown or monitoring zones must also be reported to BOEM (at renewable_reporting@boem.gov) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting.	Finfish	BOEM and NMFS

H.3. Additional Mitigation and Monitoring Measures

Table H-3. Additional Mitigation and Monitoring Measures

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
Bureau of Ocean Energy Management (BOEM) Outer Continental Shelf (OCS) Study 2020-039 – Radar Systems Mitigations to Operations					

1	Operation and maintenance (O&M)	Mitigation for Air Route Surveillance Radar (ARSR)-4 and Airport Surveillance Radar (ASR)-8/9 radars	Operational mitigations identified for impacts on ARSR-4 and for ASR-8/9:
			• Passive aircraft tracking using Automatic Dependent Surveillance – Broadcast (ADS-B) or signal/transponder
			• Increasing aircraft altitude near radar
			• Sensitivity time control (range-dependent attenuation)
			• Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates)
			• Track initiation inhibit, velocity editing, plot amplitude thresholding (limiting the amplitude of certain signals)
			• Modification mitigations for ARSR-4 and for ASR-8/9 systems:
			  ○ Utilizing the dual beams of the radar simultaneously
			  ○ In-fill radars
				Other uses – radar	BOEM and Bureau of Safety and Environmental Enforcement (BSEE)

2	O&M	Mitigation for oceanographic high frequency radars	To mitigate operational impacts on oceanographic high-frequency radars, the following options have been identified: • Data sharing from turbine operators to include the following: ○ Sharing real-time telemetry of surface currents measured at locations in the Project with radar operators	Other uses – radar	BOEM and BSEE

[5] BOEM and BSEE are in the process of transferring enforcement authorities from BOEM to BSEE.

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			○ Sharing time-series of blade rotation rates and nacelle bearing angles of each of the Project's turbines with radar operators to aid interference mitigation • Wind farm curtailment/curtailment agreement Additional modifications identified for oceanographic high-frequency radar systems to mitigate impacts: • Signal processing enhancements • Antenna modifications		
3	O&M	Mitigation for Next-Generation Radar (NEXRAD) weather radar systems	Operational mitigations to NEXRAD weather radar systems include: • Wind farm curtailment/curtailment agreement Research is being conducted to determine whether impacts on weather radar can be mitigated by using phased array radars to achieve a null in the antenna radiation pattern in the direction of the wind turbine.	Other uses – radar	BOEM and BSEE
BOEM-proposed Bird and Bat Mitigation Measures					
1	O&M	Adaptive mitigation for birds and bats	Sunrise Wind developed a Post-construction Avian and Bat Monitoring Framework that summarizes the approach to monitoring; describes overarching monitoring goals and objectives; identifies the key bat species, prioritizes questions, and data gaps unique to the region and Project Area that will be address through monitoring; and describes methods and time frames for data collection, analysis, and reporting. Sunrise Wind will engage with federal and state agencies and environmental nongovernment organizations (eNGOs) to identify appropriate monitoring options and technologies, and to facilitate acceptance of the final plan. If the reported post-construction bird and bat monitoring results indicate bird and bat impacts deviate substantially from the impact analysis included in this Environmental Impact Statement (EIS), then Sunrise Wind must make recommendations for new mitigation measures or monitoring methods.	Birds and bats	BOEM, BSEE, and United States Fish and Wildlife Service (USFWS)

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
2	O&M	Bird deterrents	Install bird deterrent devices to minimize bird attraction to operating turbines and on the offshore substations, where appropriate and where Sunrise Wind determines such devices can be safely deployed.	Birds	USFWS, BSEE, and BOEM
3	O&M	Adaptive mitigation for birds and bats	As new technologies become available for monitoring fatalities at offshore wind facilities, such as strike detection technology, Sunrise Wind will commit to deploying these technologies, and if monitoring reveals that impacts to bats are non-negligible, Sunrise Wind would employ minimization strategies and deterrent technologies.	Bats	USFWS, BOEM
Department of Defense (DOD)-proposed Measures					
1	O&M	Fiber-optic sensing technology	Distributed fiber-optic sensing (DOFS) technology proposed for the wind energy Project or associated transmission cables would be reviewed by the DOD to ensure that DOFS is not used to detect sensitive data from DOD activities, conduct any other type of surveillance of United States (U.S.) Government operations, or to otherwise pose a threat to national security.	Other uses	BOEM, BSEE, and DOD
National Historic Preservation Act (NHPA) Section 106 Mitigation Measures					
1	Construction (C)	Avoid or mitigate impacts on identified archaeological resources	Sunrise Wind must avoid any identified archaeological resource or traditional cultural property (TCP), including avoidance of 50-m (165-ft) buffers for identified archaeological resources. If Sunrise Wind cannot avoid the resource, it must perform additional investigations for the purpose of determining eligibility for listing in the National Register of Historic Places (NRHP). Of those resources determined eligible, BOEM would require Phase III data recovery investigations for the purposes of resolving adverse effects per 36 *CFR* 800.6. If Sunrise Wind determines it cannot avoid an archaeological resource or TCP after the Record of Decision (ROD) has been issued, additional Section 106 consultation will be required.	Cultural resources	BOEM, BSEE, New York State Public Service Commission (NYSPSC), New York State Historic Preservation Office (NYSHPO)
2	C	Archaeological monitoring and	Implementation of archaeological monitoring and unanticipated discoveries plans for terrestrial and submerged archaeology, which	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
		unanticipated discovery plans	include training and orientation for construction staff, designation of an Archaeologist and Qualified Marine Archaeologist, and unanticipated discovery procedures and contacts, to reduce potential impacts on any previously undiscovered archaeological resources (if present) encountered during construction.		
3	Pre-construction (Pre-C)	Historic Property Treatment Plans (HPTPs)	BOEM, with the assistance of Sunrise Wind, will develop and implement one or multiple HPTPs in consultation with consulting parties who have demonstrated interest in specific historic properties and property owners to address impacts on archaeological resources and ancient submerged landforms if they cannot be avoided. HPTPs will also provide details and specification for actions consisting of mitigation measures to resolve adverse visual effects and cumulative adverse visual effects on eight historic lighthouses in Rhode Island (RI) and Massachusetts (MA), the Scrubby Neck Schoolhouse, Town of West Tisbury, Dukes County, MA; Ancient Submerged Landform Wind Energy Area (WEA)_P-22, OCS; the Gay Head Light, Town of Aquinnah, Dukes County, MA; the Block Island Southeast Lighthouse, National Historic Landmark, Town of New Shoreham, Washington County, RI; the Chappaquiddick Island TCP; the Vineyard Sounds & Moshup'd Bridge TCP, Dukes County, MA, OCS; seven historic properties, Town of Chilmark, Dukes County, MA; 28 historic properties, Town of New Shoreham, Washington County, RI; and 10 historic properties, Town of Aquinnah, Dukes County, MA.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
4	Pre-C	Funding compensatory mitigation to resolve adverse effects on eight historic lighthouses in RI and MA	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as prepare a public interpretive/educational video to communicate the risks and hazards posed by climate change to historic lighthouses.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
5	Pre-C	Funding compensatory mitigation to resolve adverse effects of Scrubby Neck Schoolhouse	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as funding to the Town of West Tisbury for preparation of State Register/National Register nomination.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
6	Pre-C	Funding compensatory mitigation to resolve adverse effects of Ancient Submerged Landform WEA_P-22	Funding from Sunrise Wind could be applied to compensatory mitigation actions to resolve any adverse effects to ancient submerged landforms.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
7	Pre-C	Funding compensatory mitigation to resolve adverse effects on the Gay Head Light	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as funding for ongoing physical restoration projects.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
8	Pre-C	Funding compensatory mitigation to resolve adverse effects on Block Island Southeast Lighthouse	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as fund preparation of an augmented reality/virtual reality experience showing changes to property over time. Fund the capital restoration projects that enhance long-term preservation of the property and fund the implementation of hazard mitigation projects identified through recent planning efforts.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
9	Pre-C	Funding compensatory mitigation to resolved adverse effects on the Chappaquiddick	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as Coastal Hazard and Climate Change mitigation planning to address ricks to culturally significant elements of the TCP and their associated traditional practices, including habitat restoration.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
		Island TCP and the Vineyard Sounds & Moshup's Bridge TCP, MA and Outer Continental Shelf			
10	Pre-C	Funding compensatory mitigation to resolve adverse effects on Vineyard Sounds and Moshup's Bridge TCP, MA and OCS	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as funding for scholarships to Mashpee/Aquinnah Tribal members enrolling in accredited colleges or professional training programs for marine sciences, marine construction, geophysics, geology, history, anthropology, environmental sciences, or indigenous studies. Funding from Sunrise Wind could be applied to compensatory mitigation actions such as funding for an oral history project to document the Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee traditions associated with culturally significant finfish, shellfish, marine mammals, and plants at risk due to climate change.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
11	Pre-C	Funding compensatory mitigation to resolve adverse effects on seven historic properties, Town of Chilmark, MA	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as funding to the Sheriff's Meadow Foundation for physical restoration work at the Captain Samuel – Captain Mitchell West House or landscape restoration at the associated Quansoo Farm.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
12	Pre-C	Funding compensatory mitigation to resolve adverse effects on 28 historic properties, Town of New Shoreham, RI	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as investigations to identify engineering solutions for specific at-risk properties, including historic roadways, breakwaters, stone walls or cultural features that contribute to the historic setting of individual properties and districts. Funding from Sunrise Wind could be applied to compensatory mitigation actions such as implementation of resilience projects to mitigate coast hazards to specific historic properties or significant cultural features contributing	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			to the historic maritime setting of districts or buildings. Funding from Sunrise Wind could be applied to compensatory mitigation actions such as feasibility studies to assess relocation of at-risk historic buildings to BI Trust or Town Lands and public interpretation.		
13	Pre-C	Funding compensatory mitigation to resolve adverse effects on 10 historic properties, Town of Aquinnah, MA	Funding from Sunrise Wind could be applied to compensatory mitigation actions such as oral history project to document the association of the historic property with the Wampanoag Tribe of Gay Head (Aquinnah) and significance of the Shops in sharing Tribal Traditions with visitors to Aquinnah. Funding from Sunrise Wind could be applied to compensatory mitigation actions such as investigations to identify engineering solutions for specific at-risk properties, including historic roadways, breakwaters, stone walls or other cultural features that contribute the historic setting of individual properties and districts. Funding from Sunrise Wind could be applied to compensatory mitigation actions such as a town-wide historic resources survey to update 1984 inventory and incorporate additional information relating got the historic maritime contexts for properties located along shorelines and inland waters.	Cultural resources	BOEM, BSEE, NYSPSC, NYSHPO
BOEM-proposed Scenic and Visual Resource Mitigation and Monitoring Measures					
1	C, O&M	Monitoring	In coordination with BOEM, Sunrise Wind is to prepare and implement a scenic and visual resource monitoring plan that monitors and compares the visual effects of the wind farm during construction and operations/maintenance (daytime and nighttime) to the findings in the Construction and Operations Plan (COP) Visual Impact Assessment and verifies the accuracy of the visual simulations (photo and video). The monitoring plan should include monitoring and documenting the meteorological influences on actual wind turbine visibility over a duration of time from selected onshore key observation points, as determined by BOEM and the developer.	Scenic and visual resources	BOEM and BSEE

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			In addition, the developer needs to include monitoring the operation of aircraft detection lighting systems (ADLS) in the monitoring plan. The developer needs to monitor the frequency that the ADLS is operative documenting when (dates and time) the aviation warning lights are in the on position and the duration of each event. Details for monitoring and reporting procedures are to be included in the plan.		
2	C, O&M	Onshore transmission tower visual contrast mitigation	Sunrise Wind shall consider selecting a transmission tower type that has the least amount of visual contrast within the predominate setting where the transmission line is routed. Monopoles typically have a less visual contrast within built environments whereas lattice towers typically have less visual contrast in more natural settings. Consider color-treating the transmission tower to reduce visual contrast darker grays (chemically treated galvanized finishes), or powder-coated with Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or other if these colors do not accomplish the purpose. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov	Scenic and visual resources	NYSPSC
3	C, O&M	Onshore substation visual contrast mitigation	Sunrise Wind shall consider treating all substation facilities with the same color and select a color that minimizes visual contrast within the surrounding setting and as viewed from outside of the site. Consider using Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or other options if these colors do not accomplish the purpose. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov	Scenic and visual resources	NYSPSC
4	C, O&M	Onshore overhead transmission conductors visual contrast mitigation	Consider using non-specular conductors for overhead transmission powerlines to avoid glare commonly associated with untreated conductors.	Scenic and visual resources	NYSPSC

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
5	C, O&M	Onshore overhead transmission line Insulator visual contrast mitigation	Consider using polymer insulators to minimize glare commonly associated glass insulators. Use polymer insulators that are a color that minimizes visual contrast with the surrounding setting. Consider using Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or Sudan Brown, or other options if these colors do not accomplish the purpose.	Scenic and visual resources	NYSPSC
6	C, O&M	Onshore facility security fencing visual contrast mitigation	When using galvanized and other types of security fencing, consider treating the fencing to eliminate glare and minimize visual contrast with the surrounding setting. Methods include vinyl-coating, powder-coating, and oxidizing treatments. Colors should be dark grays, black, or dark brown (oxidizing treatments only).	Scenic and visual resources	NYSPSC
7	C, O&M	Onshore and offshore facility and O&M lighting	Incorporate night lighting principles and best management practices that avoid light pollution from artificial light needed for nighttime onshore and offshore construction and O&M activities, as described in the Bureau of Land Management's Technical Note 457 at https://www.blm.gov/sites/default/files/docs/2023-05/IB2023-038_att1.pdf and NPS' Sustainable Outdoor Lighting Principles at https://www.nps.gov/subjects/nightskies/sustainable-outdoor-lighting.htm.	Scenic and visual resources	NYSPSC
BOEM-proposed Measures from the Data Collection and Site Survey Activities for Renewable Energy on the Atlantic OCS Biological Assessment (BA)					
1	C, O&M, decommissioning (D)	Data collection BA Best Management Practices (BMPs)	BOEM and BSEE 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, maintenance and operations of the Sunrise Wind Project as applicable.	ESA-listed fish, marine mammals, sea turtles	BOEM and BSEE
2	C, O&M, D	Federal survey mitigation strategy	This Federal Survey Mitigation Strategy is intended to guide the development and implementation of a program to mitigate impacts of wind energy development on fisheries surveys over the expected full	Finfish, commercial and	BOEM and NOAA

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			duration (30+ years) of wind energy development in the northeast U.S. (Mitigation Program). The Mitigation Program will include survey-specific mitigation plans for each impacted survey, including both vessel and aerial surveys (survey-specific mitigation plans). This Strategy plan aims to: 1. Mitigate impacts of offshore wind energy development on National Oceanic and Atmospheric Administration (NOAA) Fisheries surveys; 2. Evaluate and integrate, where feasible, wind energy development monitoring studies with NOAA Fisheries surveys; 3. Collaboratively plan and implement NOAA Fisheries survey mitigation with partners, stakeholders, and other ocean users using the principles of best scientific information available and co-production of knowledge, including fishermen's local ecological knowledge and indigenous traditional ecological knowledge; 4. Adaptively implement this strategy recognizing the long-term nature of the surveys and the dynamic nature of wind energy development, survey technology and approaches, marine ecosystems, and human-uses of marine ecosystems; 5. Advance coordination between NOAA Fisheries and BOEM in the execution of this Strategy and share experiences and lessons-learned with other regions and countries where offshore wind energy development is being planned and underway. Full plan can be viewed here: https://repository.library.noaa.gov/view/noaa/47925	recreational fishing	
National Marine Fisheries Service (NMFS)/NOAA-proposed Mitigation for Takes of Marine Mammals Incidental to Specified Activities					
1	C, O&M, D	Training and coordination	Sunrise Wind would be required to instruct all Project personnel regarding the authority of the marine mammal monitoring team(s). For example, the high-resolution geophysical (HRG) acoustic equipment operator, pile-driving personnel, etc., would be required to	Marine mammals	NOAA and NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			immediately comply with any call for a delay or shutdown by the lead Protected Species Observer (PSO). Any disagreement between the lead PSO and the Project personnel would only be discussed after delay or shutdown has occurred. All relevant personnel and the marine mammal monitoring team would be required to participate in joint, onboard briefings that would be led by Sunrise Wind Project personnel and the lead PSO prior to the beginning of Project activities. This would serve to ensure that all relevant responsibilities, communication procedures, marine mammal monitoring and mitigation protocols, reporting protocols, safety, operational procedures, and Incidental Take Authorization (ITA) requirements are clearly understood by all involved parties. The briefing would be repeated whenever new relevant personnel (e.g., new PSOs, acoustic source operators, relevant crew) join the operation before work commences. ***North Atlantic Right Whale (NARW) Awareness Monitoring*** Sunrise Wind must use available sources of information on NARW presence, including daily monitoring of the Right Whale Sightings Advisory System, monitoring of Coast Guard VHF Channel 16 throughout each day to receive notifications of any sightings, and information associated with any regulatory management actions (e.g., establishment of a zone identifying the need to reduce vessel speeds). Maintaining daily awareness and coordination affords increased protection of NARWs by understanding NARW presence in the area through ongoing visual and passive acoustic monitoring efforts and opportunities (outside of Sunrise Wind's efforts) and allows for planning of construction activities, when practicable, to minimize potential impacts on NARWs. ***PSOs and Passive Acoustic Monitoring (PAM) Operator Training*** Sunrise Wind would employ NMFS-approved PSOs and PAM operators. The PSO field team and PAM team would have a lead member		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			(designated as the ''lead PSO'' or ''PAM lead'') who would have prior experience observing mysticetes, odontocetes and pinnipeds in the northwestern Atlantic Ocean on other offshore projects requiring PSOs. Any remaining PSOs and PAM operators must have previous experience observing marine mammals during projects and must have the ability to work with all required and relevant software and equipment. New and/or inexperienced PSOs would be paired with an experienced PSO to ensure that the quality of marine mammal observations and data recording is kept consistent. All PSOs and PAM operators would be required to complete a Permits and Environmental Compliance Plan (PECP) training as well as a 2-day training and refresher session on monitoring protocols. These trainings would be held with the PSO provider and Project compliance representatives and would occur before the start of Project activities related to the construction and development of the Sunrise Wind Project. PSOs would be required during all foundation installations, sheet pile or casing pipe installation/removal activities, Unexploded Ordinances/Munitions of Explosive Concern (UXO/MEC) detonations, and HRG surveys. More information on requirements during each activity can be found in the Proposed Monitoring and Reporting section.		
2	C, O&M, D	Vessel strike avoidance measures	This proposed rule contains numerous vessel strike avoidance measures. Sunrise Wind will be required to comply with these measures except under circumstances when doing so would create an imminent and serious threat to a person or vessel or to the extent that a vessel is unable to maneuver and because of the inability to maneuver, the vessel cannot comply (e.g., due to towing, etc.). Vessel operators and crews will receive protected species identification training prior to the start of in-water construction activities. This training will cover information about marine mammals and other protected species known to occur or which have the potential to occur in the Project Area. It will include training on making observations in	Marine mammals	NOAA & NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			both good weather conditions (i.e., clear visibility, low wind, and low sea state) and bad weather conditions (i.e., fog, high winds and high sea states, in glare). Training will not only include identification skills but will also include information and resources available regarding applicable federal laws and regulations for protected species. Sunrise Wind will abide by the following vessel strike avoidance measures: • All vessel operators and crews must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course (as appropriate) to avoid striking any marine mammal. • During any vessel transits within or to/from the Sunrise Wind Project Area, such as for crew transfers, an observer would be stationed at the best vantage point of the vessel(s) to ensure that the vessel(s) are maintaining the appropriate separation distance from marine mammals. • Year-round and when a vessel is in transit, all vessel operators will continuously monitor U.S. Coast Guard VHF Channel 16 over which NARW sightings are broadcasted. • At the onset of transiting and at least once every 4 hours, vessel operators and/or trained crew members will monitor the Project's Situational Awareness System, WhaleAlert, and the Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs. Any observations of any large whale by any Sunrise Wind staff or contractors, including vessel crew, must be communicated immediately to PSOs, PAM operator, and all vessel captains to increase situational awareness. Conversely, any large whale observation or detection via a sighting network (e.g., Mysticetus) by PSOs or PAM operators will be conveyed to vessel operators and crew. • All vessels would comply with existing NMFS regulations and speed restrictions and state regulations, as applicable, for NARWs.		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			• In the event that any Slow Zone (designated as a dynamic management area [DMA]) is established that overlaps with an area where a Project-associated vessel would operate, that vessel, regardless of size, will transit that area at 10 knots or less. • Between November 1 and April 30, all vessels, regardless of size, would operate port to port (specifically from ports in New Jersey, New York, Maryland, Delaware, and Virginia) at 10 knots or less, except for vessels while transiting in Narragansett Bay or Long Island Sound (which have not been demonstrated by best available science to provide consistent habitat for NARWs). • All vessels, regardless of size, would immediately reduce speed to 10 knots or less when any large whale, mother/calf pairs, or large assemblages of non-delphinid cetaceans are observed near (within 100 m or 328 ft) an underway vessel. • All vessels, regardless of size, would immediately reduce speed to 10 knots or less when a NARW is sighted, at any distance, by an observer or anyone else on the vessel. • If a vessel is traveling at greater than 10 knots, in addition to the required dedicated visual observer, real time PAM of transit corridors must be conducted prior to and during transits. If a NARW is detected via visual observation or PAM within or approaching the transit corridor, all crew transfer vessels must travel at 10 knots or less for the following 12 hours. Each subsequent detection will trigger a 12-hour reset. A slow-down in the transit corridor expires when there has been no further visual or acoustic detection of NARWs in the transit corridor in the past 12 hours. • All underway vessels (e.g., transiting, surveying) must have a dedicated visual observer on duty at all times to monitor for marine mammals within a 180° direction of the forward path of the vessel (90° port to 90° starboard). Visual observers must be equipped with		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			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 in this Proposed Action. Visual observers may be third-party observers (i.e., NMFS-approved PSOs) or crew members and must not have any other duties other than observing for marine mammals. Observer training related to these vessel strike avoidance measures must be conducted for all vessel operators and crew prior to the start of in-water construction activities to distinguish marine mammals from other phenomena and broadly to identify a marine mammal as a NARW, other whale (defined in this context as sperm whales or baleen whales other than NARWs), or other marine mammal. Confirmation of the observers' training and understanding of the ITA requirements must be documented on a training course log sheet and reported to NMFS. • All vessels must maintain a minimum separation distance of 500 m (1,640 ft) from NARWs. If a whale is observed but cannot be confirmed as a species other than a NARW, the vessel operator must assume that it is a NARW and take appropriate action. • If underway, all vessels must steer a course away from any sighted NARW at 10 knots or less such that the 500-m (1,640-ft) minimum separation distance requirement is not violated. If a NARW or a large whale that cannot be confirmed as a species other than a NARW is sighted within 500 m (1,640 ft) of an underway vessel, that vessel must shift the engine to neutral. Engines will not be engaged until the whale has moved outside of the vessel's path and beyond 500 m (1,640 ft). If a whale is observed but cannot be confirmed as a species other than a NARW, the vessel operator must assume that it is a NARW and take appropriate action.		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			• All vessels must maintain a minimum separation distance of 100 m (328 ft) from sperm whales and non-NARW baleen whales. If one of these species is sighted within 100 m (328 ft) of an underway vessel, that vessel must shift the engine to neutral. Engines will not be engaged until the whale has moved outside of the vessel's path and beyond 100 m (328 ft). • All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m (164 ft) from all delphinoid cetaceans and pinnipeds with an exception made for those that approach the vessel (e.g., bow-riding dolphins). If a delphinoid cetacean or pinniped is sighted within 50 m (164 ft) of an underway vessel, that vessel must shift the engine to neutral (again, with an exception made for those that approach the vessel). Engines will not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m (164 ft). • When a marine mammal(s) is sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distances (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If a marine mammal(s) is sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral, not engaging the engine(s) until the animal(s) is clear of the area. This does not apply to any vessel towing gear or any situation where respecting the relevant separation distance would be unsafe (i.e., any situation where the vessel is navigationally constrained). • All vessels underway must not divert or alter course in order to approach any marine mammal. • For in-water construction heavy machinery activities, other than impact or vibratory pile driving, if a marine mammal is on a path		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			towards or comes within 10 m (33 ft) of equipment, Sunrise Wind must cease operations until the marine mammal has moved more than 10 m (33 ft) on a path away from the activity to avoid direct interaction with equipment. • Sunrise Wind must submit a NARW vessel strike avoidance plan 180 days prior to commencement of vessel use. The plan would, at minimum, describe how PAM, in combination with visual observations, would be conducted to ensure the transit corridor is clear of right whales. The plan would also provide details on the vessel-based observer protocols on transiting vessels.		
3	C	Seasonal and daily restrictions, use of noise abatement systems, use of PSOs and PAM operators, implementation of clearance and shutdown zones, and soft start	***Seasonal and Daily Restrictions*** No foundation impact pile driving activities would occur January 1 through April 30. Based on the best scientific information available (Roberts and Halpin, 2022), the highest densities of NARWs in the Project Area are expected during the months of January through April. NMFS is requiring this seasonal work restriction to minimize the potential for NARWs to be exposed to noise incidental to impact pile driving of monopiles, which is expected to greatly reduce the number of takes of NARWs. No more than three foundation monopiles would be installed per day. Monopiles would be no larger than 15-m (50 ft) in diameter, representing the larger end of the tapered 7/15-m monopile design. For all monopiles, the minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. Hammer energies must not exceed 4,000 kJ. Sunrise Wind has requested authorization to initiate pile driving during nighttime when detection of marine mammals is visually challenging. To date, Sunrise Wind has not submitted a plan containing the information necessary, including evidence, that their proposed systems are capable of detecting marine mammals, particularly large whales, at	Marine mammals	NOAA & NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			night and at distances necessary to ensure mitigation measures are effective. The available information on traditional night vision technologies demonstrates that there is a high degree of uncertainty in reliably detecting marine mammals at night at the distances necessary for this Project (Smultea et al., 2021). Therefore, at this time, NMFS plans to only allow Sunrise Wind to initiate pile driving during daylight hours and prohibit Sunrise Wind from initiating pile driving earlier than one hour after civil sunrise or later than 1.5 hours before civil sunset. We are, however, proposing to encourage and allow Sunrise Wind the opportunity to further investigate and test advanced technology and detection systems to support their request. NMFS is proposing to condition the LOA such that nighttime pile driving would only be allowed if Sunrise Wind submits an Alternative Monitoring Plan (as part of the Pile Driving and Marine Mammal Monitoring Plan) to NMFS for approval that proves the efficacy of their night vision devices (NVDs) (e.g., mounted thermal/IR camera systems, handheld or wearable NVDs, infrared (IR) spotlights) in detecting protected marine mammals prior to making a determination in the final rule. The plan must include a full description of the proposed technology, monitoring methodology, and supporting data demonstrating the reliability and effectiveness of the proposed technology in detecting marine mammal(s) within the clearance and shutdown zones for monopiles before and during impact pile driving. The Plan should identify the efficacy of the technology at detecting marine mammals in the clearance and shutdowns under all the various conditions anticipated during construction, including varying weather conditions, sea states, and in consideration of the use of artificial lighting. ***Noise Abatement Systems*** Sunrise Wind would employ noise abatement systems, also known as noise attenuation systems (NAS), during all impact pile driving of		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			monopiles to reduce the sound pressure levels that are transmitted through the water in an effort to reduce ranges to acoustic thresholds and minimize any acoustic impacts resulting from impact pile driving. Sunrise Wind would be required to employ a big double bubble curtain or a combination of two or more NAS during these activities as well as the adjustment of operational protocols to minimize noise levels. Two categories of NAS exist: primary and secondary. A primary NAS would be used to reduce the level of noise produced by the pile driving activities at the source, typically through adjustments on to the equipment (e.g., hammer strike parameters). Primary NAS are still evolving and will be considered for use during mitigation efforts when the NAS has been demonstrated as effective in commercial projects. However, as primary NAS are not fully effective at eliminating noise, a secondary NAS would be employed. The secondary NAS is a device or group of devices that would reduce noise as it was transmitted through the water away from the pile, typically through a physical barrier that would reflect or absorb sound waves and therefore, reduce the distance the higher energy sound propagates through the water column. Together, these systems must reduce noise levels to the lowest level practicable with the goal of not exceeding measured ranges to Level A harassment and Level B harassment isopleths corresponding to those modeled assuming 10 dB sound attenuation, pending results of sound field verification (SFV; see the section titled, *Acoustic Monitoring for Sound Field and Harassment Isopleth Verification*). Noise abatement systems, such as bubble curtains, are used to decrease the sound levels radiated from a source. Bubbles create a local impedance change that acts as a barrier to sound transmission. The size of the bubbles determines their effective frequency band, with larger bubbles needed for lower frequencies. There are a variety of bubble curtain systems, confined or unconfined bubbles, and some with encapsulated bubbles or panels. Attenuation levels also vary by		

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			type of system, frequency band, and location. Small bubble curtains have been measured to reduce sound levels but effective attenuation is highly dependent on depth of water, current, and configuration and operation of the curtain (Austin et al., 2016; Koschinski and Lu¨demann, 2013). Bubble curtains vary in terms of the sizes of the bubbles and those with larger bubbles tend to perform a bit better and more reliably, particularly when deployed with two separate rings (Bellmann, 2014; Koschinski and Lu¨demann, 2013; Nehls et al., 2016). Encapsulated bubble systems (e.g., Hydro Sound Dampers (HSDs)), can be effective within their targeted frequency ranges (e.g., 100–800 hertz [Hz]), and when used in conjunction with a bubble curtain appear to create the greatest attenuation. The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. Secondary NAS that may be used by Sunrise Wind include a big bubble curtain (BBC), a hydro-sound damper (HSD), or an AdBm Helmholz resonator (Elzinga et al., 2019). See Appendix B (Protected Species Mitigation and Monitoring Plan [PSMMP]) of the ITA Application for more information on these systems (Sunrise Wind, 2022b). If a single system is used, it must be a double big bubble curtain (dBBC). Other systems (e.g., noise mitigation screens) are not considered feasible for the Sunrise Wind Project as they are in their early stages of development and field tests to evaluate performance and effectiveness have not been completed. Should the research and development phase of these newer systems demonstrate effectiveness, as part of adaptive management, Sunrise Wind may submit data on the effectiveness of these systems and request approval from NMFS to use them during pile driving. If a bubble curtain is used (single or double), Sunrise Wind would be required to maintain the following operational parameters: the bubble		

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			curtain(s) must distribute air bubbles using a target air flow rate of at least 0.5 m^3/(min*m) and must distribute bubbles around 100 percent of the piling perimeter for the full depth of the water column. The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100-percent seafloor contact; no parts of the ring or other objects should prevent full seafloor contact. Sunrise Wind must require that construction contractors train personnel in the proper balancing of airflow to the bubble ring and must require that construction contractors submit an inspection/performance report for approval by Sunrise Wind within 72 hours following the performance test. Corrections to the attenuation device to meet the performance standards must occur prior to impact driving of monopiles. If Sunrise Wind uses a noise mitigation device in addition to a BBC, similar quality control measures would be required. The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. Da¨hne et al. (2017) found that single bubble curtains that reduce sound levels by 7 to 10 decibels (dB) reduced the overall sound level by approximately 12 dB when combined as a double bubble curtain for 6-m (20 ft) steel monopiles in the North Sea. During installation of monopiles (approximately 8 m or 26.2 ft) for more than 150 WTGs in comparable water depths (greater than 25 m [82 ft]) and conditions in Europe indicate that attenuation of 10 dB is readily achieved (Bellmann, 2019; Bellmann et al., 2020) using single BBCs for noise attenuation. Designed to gather additional data regarding the efficacy of BBCs, the Coastal Virginia Offshore Wind (CVOW) pilot project systematically measured noise resulting from the impact driven installation of two 7.8-m (25.6 ft) monopiles, one installation using a dBBC and the other		

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			installation using no noise abatement system (CVOW, unpublished data). Although many factors contributed to variability in received levels throughout the installation of the piles (e.g., hammer energy, technical challenges during operation of the dBBC), reduction in broadband SEL using the dBBC (comparing measurements derived from the mitigated and the unmitigated monopiles) ranged from approximately 9–15 dB. Again, NMFS would require Sunrise Wind to apply a dBBC or a single BBC coupled with an additional noise mitigation device to ensure sound generated from the Project does not exceed that modeled (assuming 10 dB reduction) at given ranges to harassment isopleths and to minimize noise levels to the lowest level practicable. Double BBCs are successfully and widely applied across European wind development efforts and are known to reduce noise levels more than single BBC alone (e.g., Bellman et al., 2020). Sunrise Wind anticipates and NMFS agrees that the use of a noise abatement system would likely produce field measurements of the isopleth distances to the Level A harassment and Level B harassment thresholds that accord with those modeled assuming 10 dB of attenuation for impact pile driving of monopiles (refer to the Estimated Take, Proposed Mitigation, and Proposed Monitoring and Reporting sections). ***Use of PSOs and PAM Operators*** As described above, Sunrise Wind would be required to use PSOs and acoustic PSOs (i.e., PAM operators) during all foundation installation activities. At minimum, four PSOs would be actively observing marine mammals before, during, and after pile driving. At least two PSOs would be stationed on the pile driving vessel and at least two PSOs would be stationed on a secondary, dedicated PSO vessel. The dedicated PSO vessel would be located at the outer edge of the 2.3 kilometers (km; [1.4 miles; mi] in the summer; 4.4 km [2.7 mi] in the winter) large whale clearance zone (unless modified by NMFS based on SFV). Concurrently, at least one PAM operator would be actively		

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			monitoring for marine mammals before, during, and after pile driving. More details on PSO and PAM operator requirements can be found in the Proposed Monitoring and Reporting section. Furthermore, all crew and personnel working on the Sunrise Wind Project would be required to maintain situational awareness of marine mammal presence (discussed further above) and would be required to report any sightings to the PSOs. ***Clearance and Shutdown Zones*** NMFS is proposing to require the establishment of both clearance and shutdown zones during all impact pile driving of WTG and OCS–DC foundation piles, which would be monitored by visual PSOs and PAM operators before, during and after pile driving. Prior to the start of impact pile driving activities, Sunrise Wind would clear the area of marine mammals, per the clearance zones in Table 40, to minimize the potential for and degree of harassment. The purpose of ''clearance'' of a particular zone is to prevent potential instances of auditory injury and more severe behavioral disturbance or in the case of NARWs, avoid and minimize behavioral disturbance to the maximum extent practicable (for NARWs, the clearance and shutdown zones are set to any distance; see Table 40) by delaying the commencement of impact pile driving if marine mammals are detected within certain pre-defined distances from the pile being installed. PSOs would visually monitor for marine mammals for a minimum of 60 minutes immediately prior to commencement of pile driving while PAM operators would review data from at least 24 hours prior to pile driving and actively monitor hydrophones for 60 minutes immediately prior to pile driving. Prior to initiating soft-start procedures, all clearance zones must be visually confirmed to be free of marine mammals for 30 minutes immediately prior to a soft start of pile driving. If a marine mammal is observed entering or within the relevant clearance zone		

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			prior to the initiation of impact pile driving activities, pile driving must be delayed and will not begin until either the marine mammal(s) has voluntarily left the specific clearance zones and have been visually or acoustically confirmed beyond that clearance zone or when specific time periods have elapsed with no further sightings or acoustic detections have occurred (i.e., 15 minutes for small odontocetes and 30 minutes for all other marine mammal species). Mitigation zones related to impact pile driving activities were created around two different seasonal periods in consideration of the different seasonal sound speed profiles that were used in JASCO's underwater sound propagation modeling, including summer (May through November) and winter (December) (Table 40). In addition to the clearance and shutdown zones that would be monitored both visually and acoustically, NMFS is proposing to establish a minimum visibility zone to ensure that marine mammals are visually detected prior to commencement of pile driving. The minimum visibility zone would extend 2,300 m (2.3 km or 1.4 mi) from the pile during summer months and 4,400 m (4.4 km or 2.7 mi) during December (Table 40). These values correspond to the maximum low-frequency cetacean (i.e., baleen whale) distances to the Level A harassment isopleths assuming three monopiles are driven in a day, rounded up to the nearest hundred. The entire minimum visibility zone must be visible (i.e., not obscured by dark, rain, fog, etc.) for a full 30 minutes immediately prior to commencing impact pile driving. For NARWs, there is an additional requirement that the clearance zone may only be declared clear if no confirmed NARW acoustic detections (in addition to visual) have occurred during the 60-minute monitoring period. Any large whale sighted by a PSO or acoustically detected by a PAM operator that cannot be identified as a non-NARW must be treated as if it were a NARW.		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			The purpose of a shutdown is to prevent a specific acute impact, such as auditory injury or severe behavioral disturbance of sensitive species, by halting the activity. If a marine mammal is observed entering or within the respective shutdown zone (Table 40) after impact pile driving has begun, the PSO will request a temporary cessation of impact pile driving. In situations when shutdown is called for, but Sunrise Wind determines shutdown is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, reduced hammer energy must be implemented when the lead engineer determines it is practicable. Specifically, pile refusal or pile instability could result in not being able to shut down pile driving immediately. Pile refusal occurs when the pile driving sensors indicate the pile is approaching refusal, and a shutdown would lead to a stuck pile which then poses an imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk for individuals. Pile instability occurs when the pile is unstable and unable to stay standing if the piling vessel were to ''let go.'' During these periods of instability, the lead engineer may determine a shutdown is not feasible because the shutdown combined with impending weather conditions may require the piling vessel to ''let go,' which then poses an imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk for individuals. In these situations, Sunrise Wind must reduce hammer energy to the lowest level practicable. After shutdown, impact pile driving may be reinitiated once all clearance zones are clear of marine mammals for the minimum species-specific periods (15 minutes for small odontocetes and 30 minutes for all other marine mammal species). If pile driving has been shut down due to the presence of a NARW, pile driving may not restart until the NARW is no longer observed or 30 minutes has elapsed since the last detection. In cases where these criteria are not met, pile driving may		

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			restart only if necessary to maintain pile stability, at which time Sunrise Wind must use the lowest hammer energy practicable to maintain stability. Upon re-starting pile driving, soft-start protocols must be followed. The clearance and shutdown zone sizes vary by species and are shown in Tables 40, 41, and 42. All distances to the perimeter of clearance zones are the radii from the center of the pile. Pursuant to the proposed adaptive management provisions, Sunrise Wind may request modification to these zone sizes pending results of sound field verification (see Proposed Monitoring and Reporting section). Any changes to zone size would require NMFS' approval. ***Soft Start*** The use of a soft-start procedure is believed to provide additional protection to marine mammals by warning them or providing them with a chance to leave the area prior to the hammer operating at full capacity. Soft start typically involves initiating hammer operation at a reduced energy level (relative to full operating capacity) followed by a waiting period. Sunrise Wind must utilize a soft-start protocol for impact pile driving of monopiles by performing 4–6 strikes per minute at 10 to 20 percent of the maximum hammer energy for a minimum of 20 minutes. NMFS notes that it is difficult to specify a reduction in energy for any given hammer because of variation across drivers. For impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in ''bouncing'' of the hammer as it strikes the pile, resulting in multiple ''strikes''; however, as mentioned previously, Sunrise Wind will target less than 20 percent of the total hammer energy for the initial hammer strikes during soft start. A soft start will be required at the beginning of each day's monopile installation and at any time following a cessation of impact pile driving of 30 minutes or longer. If a marine mammal is detected within or about to enter the applicable clearance zones prior		

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			to the beginning of soft-start procedures, impact pile driving would be delayed until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings (i.e., 15 minutes for small odontocetes and 30 minutes for all other species).		
4	C	Daily restrictions; the use of PSOs; implementation of clearance and shutdown zones; and use of soft start (if a pneumatic impact hammer is used)	***Seasonal and Daily Restrictions*** Sunrise Wind has proposed to install and remove the sheet piles or casing pipe scenario within the first year of the effective period of the regulations and LOA. NMFS is not requiring any seasonal work restrictions for landfall construction in this proposed rule due to the relatively short duration of work (i.e., low associated impacts). Sunrise Wind would be required, however, to conduct vibratory pile driving associated with sheet pile installation and pneumatic hammering of casing pipes during daylight hours only. Although NARWs do migrate in coastal waters, they are not expected to occur in Narragansett Bay where work would be occurring. The distance to the Level B harassment isopleth (9.74 km) for installation of steel sheet piles and the maximum distance to the Level A isopleth (3.95 km) for installation of a casing pipe do not extend beyond the mouth of Narragansett Bay; thus, it is unlikely that right whales (or most species of marine mammals considered here) would be exposed to vibratory pile driving during sheet pile installation at levels close to the 120 dB Level B harassment threshold or pneumatic hammering at Level A harassment thresholds. ***Use of PSOs*** Prior to the start of vibratory pile driving or pneumatic hammering activities, at least two PSOs located at the best vantage points would monitor the clearance zone for 30 minutes, continue monitoring during pile driving or pneumatic hammering, and for 30 minutes following	Marine mammals	NOAA & NMFS

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			cessation of either activity. The clearance zones must be fully visible for at least 30 minutes and all marine mammal(s) must be confirmed to be outside of the clearance zone for at least 30 minutes immediately prior to initiation of either activity. ***Clearance and Shutdown Zones*** Sunrise Wind would establish clearance and shutdown zones for vibratory pile driving activities associated with sheet pile installation (Table 43.) and pneumatic hammering for casing pipe installation (Table 44.). If a marine mammal is observed entering or is observed within the respective zones, activities will not commence until the animal has exited the zone or a specific amount of time has elapsed since the last sighting (i.e., 30 minutes for large whales and 15 minutes for dolphins, porpoises, and pinnipeds). If a marine mammal is observed entering or within the respective shutdown zone after vibratory pile driving or pneumatic hammering has begun, the PSO will call for a temporary cessation of the activity. Pile driving or hammering must not be restarted until either the marine mammal(s) has voluntarily left the specific clearance zones and has been visually confirmed beyond that clearance zone or when specific time periods have elapsed with no further sightings or acoustic detections have occurred (i.e., 15 minutes for small odontocetes and 30 minutes for all other marine mammal species). Because a vibratory hammer can grip a pile without operating, pile instability should not be a concern and no caveat for re-starting pile driving due to pile instability is proposed.		

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]

Table 43—Distances to Harassment thresholds and Mitigation Zones[a] During Vibratory Sheet Pile Driving

Marine Mammal Species	Level A Harassment (SEL cum) (m)	Level B Harassment (m)	Clearance Zone (m)	Shutdown Zone (m)
Low-frequency cetaceans				
Fin whale*	5	9,740	200	50
Minke whale	5	9,740	200	50
Sei whale*	5	9,740	200	50
Humpback whale	5	9,740	200	50
North Atlantic right whale*	5	9,740	200	50
Blue whale*	5	9,740	200	50
Mid-frequency cetaceans				
Sperm whale*	--	9,740	200	50
Atlantic white-sided dolphin	--	9,740	200	50
Atlantic spotted dolphin	--	9,740	200	50
Common dolphin	--	9,740	200	50
Risso's dolphin	--	9,740	200	50
Bottlenose dolphin	--	9,740	200	50
Pilot whale	--	9,740	200	50
High-frequency cetaceans				
Harbor porpoise	190	9,740	200	200
Phocid pinnipeds (in water)				
Gray seal	10	9,740	200	10
Harbor seal	10	9,740	200	10

* Denotes species listed under the Endangered Species Act.

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]

[a] The original mitigation and monitoring distances are found in Table 18 in Sunrise Wind's PSMMP; however, NMFS has slightly rounded/modified some of these ranges for PSO clarity.

Table 44—Distances To Harassment Thresholds and Mitigation Zones[a] During Impact Installation of the Casing Pipe

Marine Mammal Species	Level A Harassment (SELcum) (m)	Level B Harassment (m)	Clearance Zone (m)	Shutdown Zone (m)
Low-frequency cetaceans				
Fin whale*	3,870	920	500	500
Minke whale	3,870	920	500	500
Sei whale*	3,870	920	500	500
Humpback whale	3,870	920	500	500
North Atlantic right whale*	3,870	920	500	500
Blue whale*	3,870	920	500	500
Mid-frequency cetaceans				
Sperm whale*	230	920	100	100
Atlantic white-sided dolphin	230	920	100	100
Atlantic spotted dolphin	230	920	100	100
Common dolphin	230	920	100	100
Risso's dolphin	230	920	100	100
Bottlenose dolphin	230	920	100	100
Pilot whale	230	920	100	100
High-frequency cetaceans				
Harbor porpoise	3.950	920	500	500
Phocid pinnipeds (in water)				
Gray seal	1,290	9,740	100	100
Harbor seal	1,290	9,740	100	100

* Denotes species listed under the Endangered Species Act.

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			[a] The original mitigation and monitoring distances are found in Table 18 in Sunrise Wind's PSMMP; however, NMFS has slightly rounded/modified some of these ranges for PSO clarity.		
5	C	Seasonal and daily restrictions; use of noise abatement systems; use of PSOs and PAM operators to visually and acoustically monitor for marine mammals; implementation of clearance zones	***As Low as Reasonably Practicable (ALARP) Approach*** For any UXOs/MECs that require removal, Sunrise Wind would be required to implement the As Low as Reasonably Practicable (ALARP) process. This process would require Sunrise Wind to undertake ''lift-and-shift'' (i.e., physical removal) and then lead up to in situ disposal, which could include low-order (deflagration) to high order (detonation) methods of removal. Another potential approach involves the cutting of the UXO/MEC to extract any explosive components. Implementing the ALARP approach would minimize potential impacts to marine mammals as UXOs/MECs would only be detonated as a last resort. ***Seasonal and Daily Restrictions*** Sunrise Wind would be limited to detonating a total of three UXOs/MECs between May 1 and November 31 to reduce impacts to NARWs during peak occurrence periods. Furthermore, UXO/MEC detonation would be limited to daylight hours only to ensure that visual PSOs can confirm appropriate clearance of the site prior to detonation events. ***Noise Abatement Systems*** Sunrise Wind would be required to use a noise abatement system during all UXO/MEC detonations, should detonations be determined to be necessary. Although the exact level of noise attenuation that can be achieved by noise abatement systems is unknown, available data from Bellmann et al. (2020) and Bellmann and Betke (2021) provide a reasonable expectation that the noise abatement systems would be able to achieve at least 10 dB attenuation. SFV would be required for all detonation events to verify the modeled distances, assuming 10 dB	Marine mammals	NOAA & NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			attenuation, are representative of the sound fields generated during detonations. This level of noise reduction would provide substantial reductions in impact zones for low-frequency cetaceans, such as the NARW. For example, assuming the largest UXO/MEC charge weight (454 kilograms; kg [1,000 pounds; lbs] E12) at a depth of 45 m (150 ft), 10 dB of attenuation reduces the Level A harassment (PTS) zone from 243 km^2 (93.8 mi^2) to approximately 45 km^2 (17.4 mi^2). The Level B harassment zone, given the same parameters, would be decreased from 1,158 km^2 (447 mi^2) to 445 km^2 (171.8 mi^2). However, and as previously stated in this proposed rule, Sunrise Wind does not expect that all three of the potential UXOs/MECs would be of the largest charge weight; this weight was used as a conservative option in estimating exposures and take of marine mammals. ***Use of PSOs and PAM Operators*** PSOs would monitor clearance zones in vessels and when the clearance zone is larger than 5 km (3.1 mi) , aircraft. Prior to the UXO/MEC detonation, at least two PSOs per observing platform (i.e., vessels, plane) located at the best vantage points would monitor the clearance zone for 60 minutes, continue monitoring during the detonation, and for 30 minutes following the event. The clearance zones must be fully visible for at least 60 minutes and all marine mammal(s) must be confirmed to be outside of the clearance zone for at least 30 minutes immediately prior to initiation of either activity. In addition to visual monitoring, real-time PAM monitoring is also proposed. A PAM operator would be stationed on at least one of the dedicated monitoring vessels in addition to the PSOs or located remotely/onshore to acoustically monitor a zone that encompasses a minimum of a 10-km (6.2-mi) radius around the source. PAM would be conducted for at least 60 minutes prior to detonation and the zone must be acoustically clear during this time. In the case of visual or acoustic detection, the lead		

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			PSO will be responsible for requesting the designated crewmember to implement a delay in UXO detonation. ***Clearance Zones*** Sunrise Wind proposed to clear a 3.78-km (2.3-mi) radius zone around the detonation site prior to detonations using both visual and acoustic monitoring methods. This distance represents the modeled Level A (PTS) harassment zone for low-frequency cetaceans (i.e., large whales) assuming the largest 454-kg (1,000-lb) charge weight and use of a bubble curtain (Table 45.). However, NMFS is proposing to require more protective zone sizes in order to ensure the least practicable adverse impact, which includes minimizing the potential for temporary threshold shift (TTS). As stated above, it is not currently known how easily Sunrise Wind will be able to identify UXO/MEC charge weights in the field. For this reason, NMFS proposes to require Sunrise Wind to clear a zone extending 10 km (6.2 mi) for large whales, 2 km (1.2 mi) for delphinids, 10 km (6.2 mi) for harbor porpoises, and 5 km (3.1 mi) for seals (Table 45.). These zones are based on (but not equal to) the largest TTS threshold distances for a 454-kg (1,000-lb) charge at any site modeled. However, NMFS notes that these zone sizes may be adjusted based on SFV and confirmation of UXO/MEC/doner charge sizes. Moreover, if Sunrise Wind indicates to NMFS they will be able to easily and reliably identify charge weights in the field, NMFS would develop clearance zones in the final rule for each charge weight analyzed. If a marine mammal is observed entering or within the clearance zone prior to denotation, the activity would be delayed. Only when the marine mammals have been confirmed to have voluntarily left the clearance zones and been visually confirmed to be beyond the clearance zone, or when 60 minutes have elapsed without any redetections for whales (including the NARW) or 30 minutes have elapsed without any		

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subsequent detections of delphinids, harbor porpoises, or seals may detonation of UXOs/MECs occur.

Table 45—Largest Modeled Harassment and Clearance Zones for Unexploded Ordinances/Munitions of Explosive Concern Detonation of E12 (454 Kg) Charge Assuming 10 dB Noise Abatement

Marine Mammal Species	Distances to Zones for E12 (454 kg [1,000 lb]) Unexploded Ordinances/Munitions of Explosive Concern Charge Weight [a] [b]		
	Level A Harassment Zone (m)	Level B Harassment Zone (m)	Clearance Zones (m)
Mysticetes			
Fin whale* Minke whale Sei whale* Humpback whale North Atlantic right whale* Blue whale*	3,700	11,800	10,000
Odontocetes			
Sperm whale* Atlantic white-sided dolphin Atlantic spotted dolphin Common dolphin Risso's dolphin Bottlenose dolphin Long-finned pilot whale	[b] 500	2,500	2,000
Harbor porpoise	6,200	13,700	10,000
Phocid pinnipeds (in water)			
Gray seal Harbor seal	1,500	[b] 7,100	5,000

* Denotes species listed under the Endangered Species Act.

[a] At time of preparing this proposed rule, Sunrise Wind has not provided NMFS evidence they will be able to reliably determine the charge weight of any UXO/MEC that must be detonated; therefore, NMFS assumes all UXO/MECs could be of the largest size modeled. If Sunrise Wind provides information they can detect charge weights in the field prior to issuance of the final rule, if issued, NMFS may modify

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			the clearance zone to ones based on charge weights distances to PTS and TTS. Distances to PTS and TTS thresholds have been identified by Sunrise Wind in Appendix B of their application. [b] The original mitigation and monitoring distances are found in Sunrise Wind's UXO/MEC Modeling Report (Hannay and Zykov, 2022); however, NMFS has rounded these ranges for PSO clarity.		
6	C	All HRG surveys	***General*** There are no mitigation measures prescribed for sound sources operating at frequencies greater than 180 kHz as these would be expected to fall outside of marine mammal hearing ranges and not result in harassment; however, all HRG survey vessels would be subject to the aforementioned vessel strike avoidance measures described earlier in this section. Furthermore, due to the frequency range and characteristics of some of the sound sources, shutdown, clearance, and ramp-up procedures are not proposed to be conducted during HRG surveys utilizing only non-impulsive sources (e.g., ultra-short baseline and other parametric sub-bottom profilers [SBPs]) with exception to usage of Climate Hazards Center Infrared Precipitation with Stations Data (CHIRPS) and other non-parametric SBPs. PAM would not be required during HRG surveys. While NMFS agrees that PAM can be an important tool for augmenting detection capabilities in certain circumstances, its utility in further reducing impacts during HRG survey activities is limited. We have provided a thorough description of our reasoning for not requiring PAM during HRG surveys in several Federal Register notices (e.g., 87 *FR* 40796, July 8, 2022; 87 *FR* 52913, August 3, 2022; 87 *FR* 51356, August 22, 2022). ***Seasonal and Daily Restrictions*** Given the potential impacts to marine mammals from exposure to HRG survey noise sources are relatively minor (e.g., limited to Level B	Marine mammals	NOAA and NMFS

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			harassment) and that the distances to the Level B harassment isopleth is very small (maximum distance is 141 m [462.6 ft]), NMFS is not proposing to implement any seasonal or time-of-day restrictions for HRG surveys. Although no temporal restrictions are proposed, NMFS would require Sunrise Wind to deactivate acoustic sources during periods where no data is being collected except as determined necessary for testing. Any unnecessary use of the acoustic source would be avoided. ***Use of PSOs*** During all HRG survey activities using boomers, sparkers, and CHIRPS, one PSO would be required to monitor during daylight hours and two would be required to monitor during nighttime hours per vessel. PSOs would begin visually monitoring 30 minutes prior to the initiation of the specified acoustic source (i.e., ramp-up, if applicable) through 30 minutes after the use of the specified acoustic source has ceased. PSOs would be required to monitor the appropriate clearance and shutdown zones. These zones would be based around the radial distance from the acoustic source and not from the vessel. ***Clearance, Shutdown, and Vessel Separation Zones*** Sunrise Wind would be required to implement a 30-minute clearance period of the clearance zones (Table 46) immediately prior to the commencing of the survey or when there is more than a 30-minute break in survey activities and PSOs have not been actively monitoring. The clearance zones would be monitored by PSOs using the appropriate visual technology. If a marine mammal is observed within a clearance zone during the clearance period, ramp-up (described below) may not begin until the animal(s) has been observed voluntarily 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 seals, and 30 minutes for all other species). In any case when the clearance process has begun in conditions with good visibility, including		

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			via the use of night vision equipment (IR/thermal camera), and the lead PSO has determined that the clearance zones are clear of marine mammals, survey operations would be allowed to commence (i.e., no delay is required) despite periods of inclement weather and/or loss of daylight. Once the survey has commenced, Sunrise Wind would be required to shut down boomers, sparkers, and CHIRPs if a marine mammal enters a respective shutdown zone (Table 46). In cases when the shutdown zones become obscured for brief periods due to inclement weather, survey operations would be allowed to continue (i.e., no shutdown is required) so long as no marine mammals have been detected. The use of boomers, sparkers, and CHIRPS would not be allowed to commence or resume until the animal(s) has been confirmed to have left the shutdown zone or until a full 15 minutes (for small odontocetes and seals) or 30 minutes (for all other marine mammals) have elapsed with no further sighting. Any large whale sighted by a PSO within 1,000 m (3,281 ft) of the boomers, sparkers, and CHIRPs that cannot be identified as a non-NARW would be treated as if it were a NARW. The shutdown requirement would be waived for small delphinids of the following genera: Delphinus, Stenella, Lagenorhynchus, and Tursiops. Specifically, if a delphinid from the specified genera is visually detected approaching the vessel (i.e., to bow-ride) or towed equipment, shutdown would not be required. Furthermore, if there is uncertainty regarding identification of a marine mammal species (i.e., whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived), the PSOs would use their best professional judgment in making the decision to call for a shutdown. Shutdown would be required if a delphinid that belongs to a genus other than those specified is detected in the shutdown zone. If a boomer, sparker, or CHIRP is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, it would be allowed to be activated again without ramp-up		

<table>
<tr><th>No.</th><th>Proposed Project Phase</th><th>Mitigation & Monitoring Measures</th><th>Table H-3
Description of Additional Mitigation and Monitoring Measures</th><th>Resource Area Mitigated</th><th>BOEM's Identification of the Anticipated Enforcing Agency[5]</th></tr>
<tr><td></td><td></td><td></td><td>
only if (1) PSOs have maintained constant observation, and (2) no additional detections of any marine mammal occurred within the respective shutdown zones. If a boomer, sparker, or CHIRP was shut down for a period longer than 30 minutes, then all clearance and ramp-up procedures would be required, as previously described.

Table 46—Harassment Threshold Ranges and Mitigation Zones During HRG Surveys
<table>
<tr><th rowspan="2">Marine Mammal Species</th><th colspan="2">Level B Harassment Zone(m)</th><th rowspan="2">Clearance Zone(m)</th><th rowspan="2">Shutdown Zone(m)</th></tr>
<tr><th>Boomer/ sparker</th><th>CHIRPs</th></tr>
<tr><td colspan="5">Low-frequency cetaceans</td></tr>
<tr><td>Fin whale*</td><td rowspan="6">141</td><td rowspan="6">48</td><td>100</td><td>100</td></tr>
<tr><td>Minke whale</td><td>100</td><td>100</td></tr>
<tr><td>Sei whale*</td><td>100</td><td>100</td></tr>
<tr><td>Humpback whale</td><td>100</td><td>100</td></tr>
<tr><td>North Atlantic right whale*</td><td>500</td><td>500</td></tr>
<tr><td>Blue whale*</td><td>100</td><td>100</td></tr>
<tr><td colspan="5">Mid-frequency cetaceans</td></tr>
<tr><td>Sperm whale*</td><td rowspan="7">141</td><td rowspan="7">48</td><td>100</td><td>100</td></tr>
<tr><td>Atlantic white-sided dolphin</td><td>100</td><td>N/A</td></tr>
<tr><td>Atlantic spotted dolphin</td><td>100</td><td>N/A</td></tr>
<tr><td>Common dolphin</td><td>100</td><td>N/A</td></tr>
<tr><td>Risso's dolphin</td><td>100</td><td>100</td></tr>
<tr><td>Bottlenose dolphin</td><td>100</td><td>N/A</td></tr>
<tr><td>Pilot whale</td><td>100</td><td>100</td></tr>
<tr><td colspan="5">High-frequency cetaceans</td></tr>
<tr><td>Harbor porpoise</td><td>141</td><td>48</td><td>100</td><td>100</td></tr>
<tr><td colspan="5">Phocid pinnipeds (in water)</td></tr>
<tr><td>Gray seal</td><td rowspan="2">141</td><td rowspan="2">48</td><td rowspan="2">100</td><td rowspan="2">100</td></tr>
<tr><td>Harbor seal</td></tr>
</table>
Note: n/a = no shutdown zone mitigation will be applied as these species are known to bow-ride.
* Denotes species is listed under the Endangered Species Act.
</td><td></td><td></td></tr>
</table>

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			Ramp-Up At the start or restart of the use of boomers, sparkers, and/or CHIRPs, a ramp-up procedure would be required unless the equipment operates on a binary on/off switch. A ramp-up procedure, involving a gradual increase in source level output, is required at all times as part of the activation of the acoustic source when technically feasible. Operators would ramp up sources to half power for 5 minutes and then proceed to full power. Prior to a ramp-up procedure starting, the operator would have to notify the lead PSO of the planned start of the ramp-up. This notification time would not be less than 60 minutes prior to the planned ramp-up activities as all relevant PSOs would need the appropriate 30-minute period to monitor prior to the initiation of ramp-up. Prior to ramp-up beginning, the operator must receive confirmation from the PSO that the clearance zone is clear of any marine mammals. All ramp-ups would be scheduled to minimize the overall time spent with the source being activated. The ramp-up procedure must be used at the beginning of HRG survey activities or after more than a 30-minute break in survey activities using the specified HRG equipment to provide additional protection to marine mammals in or near the survey area by allowing them to vacate the area prior to operation of survey equipment at full power. Sunrise Wind would not initiate ramp-up until the clearance process has been completed (see Clearance and Shutdown Zones section above). Ramp-up activities would be delayed if a marine mammal(s) enters its respective clearance zone. Ramp-up would only be reinitiated if the animal(s) has been observed exiting its respective shutdown zone or until additional time has elapsed with no further sighting (i.e., 15 minutes for small odontocetes and seals, and 30 minutes for all other species). ***Autonomous Surface Vehicle (ASV) Use*** Should Sunrise Wind use an ASV for HRG survey operations, the following measures would be implemented:		

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			• When in use, the ASV would be within 800 m (2,625 ft) of the primary vessel while conducting survey operations; • Two PSOs would be stationed aboard the mother vessel at the best vantage points to monitor the clearance and shutdown zones around the ASV; • A dual thermal/high-definition camera would be installed on the mother vessel, facing forward and angled in a direction to provide a field of view ahead of the vessel and around the ASV. PSOs would monitor the real-time camera output on handheld tablets. A monitor would also be installed on the bridge, displaying the real-time image from the thermal/HD camera installed on the ASV itself, providing an additional forward field of view from the ASV; • Night-vision goggles with thermal clip-ons, and a handheld spotlight would be used to monitor the ASV during survey operations during periods of reduced visibility (e.g., darkness, rain, fog).		
7	Pre-C, C, O&M, D	Training	All crew undertaking the fishery survey activities would be required to receive protected species identification training prior to activities occurring. Marine mammal monitoring must occur prior to, during, and after haul-back and gear must not be deployed if a marine mammal is observed in the area. Trawl operations must only start after 15 minutes of no marine mammal sightings within 1 nm (1.9 km) of the sampling station.	Marine mammals	NOAA and NMFS
8	Pre-C, C, O&M, D	Trawl surveys	Sunrise Wind would be required to undertake BMPs to reduce risks to marine mammals during trawl surveys. These include: • All captains and crew conducting trawl surveys will be trained in marine mammal detection and identification; • Survey vessels will adhere to all vessel mitigation measures (see Proposed Mitigation section);	Marine mammals	NOAA and NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			• Marine mammal monitoring will be conducted by the captain and/or a member of the scientific crew before (15 minutes prior to within 1 nm [1.9 km]), during, and after haul back; • Trawl operations will commence as soon as possible once the vessel arrives on station; • If a marine mammal (other than dolphins and porpoises) is sighted within 1 nm (1.9 km) of the planned location in the 15 minutes before gear deployment, Sunrise Wind will delay setting the trawl until marine mammals have not been resighted for 15 minutes or Sunrise Wind may move the vessel away from the marine mammal to a different section of the sampling area. If, after moving on, marine mammals are still visible from the vessel, Sunrise Wind may decide to move again or to skip the station; • Gear will not be deployed if marine mammals are observed within the area and if a marine mammal is deemed to be at risk of interaction, all gear will be immediately removed; • Sunrise Wind will maintain visual monitoring effort during the entire period of time that trawl gear is in the water (i.e., throughout gear deployment, fishing, and retrieval). If marine mammals are sighted before the gear is fully removed from the water, Sunrise Wind will take the most appropriate action to avoid marine mammal interaction; • Limit tow time to 20 minutes and monitoring for marine mammals throughout gear deployment, fishing, and retrieval; • Sunrise Wind will open the codend of the net close to the deck/sorting area to avoid damage to animals that may be caught in gear; and • Trawl nets will be fully cleaned and repaired (if damaged) before setting again. Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures		

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			would provide the means of affecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.		
NMFS/NOAA-proposed Monitoring and Reporting for Take of Marine Mammals Incidental to Specified Activities					
1	Pre-C, C, O&M, D	PSO requirements	Sunrise Wind would be required to collect sighting data and behavioral response data related to construction activities for marine mammal species observed in the region of the activity during the period in which the activities occur using NMFS-approved visual and acoustic PSOs (see Proposed Mitigation section). All observers must be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. PSOs would monitor all clearance and shutdown zones prior to, during, and following impact pile driving, vibratory pile driving, pneumatic hammering, UXO/ MEC detonation, and during HRG surveys using boomers, sparkers, and CHIRPs (with monitoring durations specified further below). PSOs will also monitor the Level B harassment zones and will document any marine mammals observed within these zones, to the extent practicable (noting that some zones are too large to fully observe). Observers would be located at the best practicable vantage points on the pile driving vessel and, where required, on an aerial platform. Full details regarding all marine mammal monitoring must be included in relevant plans (e.g., Pile Driving and Marine Mammal Monitoring Plan) that, under this Proposed Action, Sunrise Wind would be required to submit to NMFS for approval at least 180 days in advance of the commencement of any construction activities. The following measures apply to all visual monitoring efforts: 1. Monitoring must be conducted by NMFS-approved, trained PSOs who would be placed at the primary location relevant to the activity (i.e.,	Marine mammals	NOAA and NMFS

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			pile driving vessel, pneumatic hammering location, UXO/MEC vessel, HRG survey vessel), dedicated PSO vessels (e.g., additional UXO/MEC vessel(s) when the detonation area is larger than 2 km), and aerial survey plane and must be in positions that allow for the best vantage point to monitor for marine mammals and implement the relevant clearance and shutdown procedures, when determined to be applicable. 2. PSO must be independent third-party observers and must have no tasks other than to conduct observational effort, collect data, and communicate with and instruct the relevant vessel crew with regard to the presence of protected species and mitigation requirements. 3. During all observation periods related to pile driving (impact and vibratory), pneumatic hammering, UXO/ MEC detonations, and HRG surveys, PSOs would be located at the best vantage point(s) in order to ensure 360° visual coverage of the entire clearance and shutdown zones around the observing platform and as much of the Level B harassment zone as possible while still maintaining a safe work environment. 4. PSOs may not exceed 4 consecutive watch hours, must have a minimum 2-hour break between watches, and may not exceed a combined watch schedule of more than 12 hours in a single 24-hour period; 5. PSOs would be required to use appropriate equipment (specified below) to monitor for marine mammals. During periods of low visibility (e.g., darkness, rain, fog, poor weather conditions, etc.), PSOs would be required to use alternative technologies (i.e., infrared or thermal cameras) to monitor the shutdown and clearance zones. 6. PSOs should have the following minimum qualifications: a. Visual acuity in both eyes (corrected is permissible) sufficient for discernment of moving targets at the water's surface with the		

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			ability to estimate the target size and distance. The use of binoculars is permitted and may be necessary to correctly identify the target(s); b. Ability to conduct field observations and collect data according to the assigned protocols; c. Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; d. Writing skills sufficient to document observations, including but not limited to: the number and species of marine mammals observed, the dates and times of when in-water construction activities were conducted, the dates and time when in-water construction activities were suspended to avoid potential incidental injury of marine mammals from construction noise within a defined shutdown zone, and marine mammal behavior; and e. Ability to communicate orally, by radio, or in-person, with Project personnel to provide real-time information on marine mammals observed in the area, as necessary. Observer teams employed by Sunrise Wind, in satisfaction of the mitigation and monitoring requirements described herein, must meet the following additional requirements: 7. At least one observer must have prior experience working as an observer. 8. Other observers may substitute education (a degree in biological science or a related field) or training for experience. 9. One observer will be designated as lead observer or monitoring coordinator (''lead PSO''). This lead PSO would be required to have a minimum of 90 days of at-sea experience working in this role in an		

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			offshore environment and would be required to have no more than 18 months elapsed since the conclusion of their last at-sea experience. 10.At least one PSO located on platforms (either vessel-based or aerial) would be required to have a minimum of 90 days of at-sea experience working in this role in an offshore environment and would be required to have no more than 18 months elapsed since the conclusion of their last at-sea experience. 11.All PSOs must be approved by NMFS. Sunrise Wind would be required to submit resumes of the initial set of PSOs necessary to commence the Project to NMFS OPR for approval at least 60 days prior to the first day of in-water construction activities requiring PSOs. Resumes would need to include the dates of training and any prior NMFS approval as well as the dates and description of their last PSO experience and must be accompanied by information documenting their successful completion of an acceptable training course. NMFS would allow 3 weeks to approve PSOs from the time that the necessary information is received by NMFS after which any PSOs that meet the minimum requirements would automatically be considered approved. Some Sunrise Wind activities may require the use of PAM, which would necessitate the employment of at least one acoustic PSO (aka PAM operator) on duty at any given time. PAM operators would be required to meet several of the specified requirements described above for PSOs, including: 2, 4, 6b–e, 8, 9, 10, and 11. Furthermore, PAM operators would be required to complete a specialized training for operating PAM systems and must demonstrate familiarity with the PAM system on which they would be working. PSOs would be able to act as both acoustic and visual observers for the Project if the individual(s) demonstrates that they have had the		

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			required level and appropriate training and experience to perform each task. However, a single individual would not be allowed to concurrently act in both roles or exceed work hours specified in #4 above. Sunrise Wind's personnel and PSOs would also be required to use available sources of information on NARW presence to aid in monitoring efforts. This includes: 1. Daily monitoring of the Right Whale Sightings Advisory System; 2. Consulting of the WhaleAlert app; and, 3. Monitoring of the Coast Guard's VHF Channel 16 throughout the day to receive notifications of any sightings and information associated with any DMAs to plan construction activities and vessel routes, if practicable, to minimize the potential for co-occurrence with NARWs.		
2	C	WTG and OCS–DC foundation installation	Sunrise Wind would be required to implement the following monitoring procedures during all impact pile driving of WTG and OCS–DC foundations. During all observations associated with impact pile driving, PSOs would use high magnification (7x) binoculars and the naked eye to search continuously for marine mammals. At least one PSO on the foundation pile driving vessel and secondary dedicated PSO vessel must be equipped with "big eye" binoculars (e.g., 25 x 50; 2,7 view angle; individual ocular focus; height control) of appropriate quality. These would be pedestal-mounted on the deck at the most appropriate vantage point that provides optimal sea surface observation and PSO safety. Sunrise Wind would be required to have a minimum of four PSOs actively observing marine mammals before, during, and after (specific times described below) the installation of foundation piles (monopiles). At least two PSOs must be actively observing on the pile driving vessel	Marine mammals	NOAA and NMFS

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			while at least two PSOs are actively observing on a secondary, PSO-dedicated vessel. Concurrently, at least one acoustic PSO (i.e., PAM operator) must be actively monitoring for marine mammals before, during and after impact pile driving. As described in the Proposed Mitigation section, if the minimum visibility zone cannot be visually monitored at all times, pile driving operations may not commence or, if active, must shutdown, unless Sunrise Wind determines shutdown is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals. To supplement visual observation efforts, Sunrise Wind would utilize at least one PAM operator before, during, and after pile installation. This PAM operator would assist the PSOs in ensuring full coverage of the clearance and shutdown zones. All on-duty visual PSOs would remain in contact with the on-duty PAM operator, who would monitor the PAM systems for acoustic detections of marine mammals in the area. In some cases, the PAM operator and workstation may be located onshore or they may be located on a vessel. In either situation, PAM operators would maintain constant and clear communication with visual PSOs on duty regarding detections of marine mammals that are approaching or within the applicable zones related to impact pile driving. Sunrise Wind would utilize PAM to acoustically monitor the clearance and shutdown zones (and beyond for situational awareness), and would record all detections of marine mammals and estimated distance, when possible, to the activity (noting whether they are in the Level A harassment or Level B harassment zones). To effectively utilize PAM, Sunrise Wind would implement the following protocols: • PAM operators would be stationed on at least one of the dedicated monitoring vessels in addition to the PSOs or located remotely/onshore.		

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			• PAM operators would have completed specialized training for operating PAM systems prior to the start of monitoring activities, including identification of species-specific mysticete vocalizations (e.g., NARWs). • The PAM operator(s) on-duty would monitor the PAM systems for acoustic detections of marine mammals that are vocalizing in the area. • Any detections would be conveyed to the PSO team and any PSO sightings would be conveyed to the PAM operator for awareness purposes, and to identify if mitigation is to be triggered. • For real-time PAM systems, at least one PAM operator would be designated 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. • The PAM operator would inform the lead PSO on duty of marine mammal detections approaching or within applicable ranges of interest to the pile driving activity via the data collection software system (i.e., Mysticetus or similar system), who would be responsible for requesting that the designated crewmember implement the necessary mitigation procedures (i.e., delay or shutdown). • Acoustic monitoring during nighttime and low visibility conditions during the day would complement visual monitoring (e.g., PSOs and thermal cameras) and would cover an area of at least the Level B harassment zone around each foundation. All PSOs and PAM operators would be required to begin monitoring 60 minutes prior to and during all impact pile driving and for 30 minutes after impact driving. However, PAM operators must review acoustic data from the previous 24 hours as well. As described in the Proposed Mitigation section, impact pile driving of monopiles would only commence when the minimum visibility zone (extending 2.3 km from the pile during summer months and 4.4 km during December for WTG		

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			foundation installations, and 1.6 km during summer months and 2.7 km during December for OCS–DC foundation installations) is fully visible (e.g., not obscured by darkness, rain, fog, etc.) and the clearance zones are clear of marine mammals for at least 30 minutes, as determined by the lead PSO, immediately prior to the initiation of impact pile driving. For NARWs, any visual (regardless of distance) or acoustic detection would trigger a delay to the commencement of pile driving. In the event that a large whale is sighted or acoustically detected that cannot be confirmed as a non-NARW species, it must be treated as if it were a NARW. Following a shutdown, monopile installation may not recommence until the minimum visibility zone is fully visible and the clearance zone is clear of marine mammals for 30 minutes and no marine mammals have been detected acoustically within the PAM clearance zone for 30 minutes. Sunrise Wind must prepare and submit a Pile Driving and Marine Mammal Monitoring Plan to NMFS for review and approval at least 180 days before the start of any pile driving. The plans must include final pile driving Project design (e.g., number and type of piles, hammer type, noise abatement systems, anticipated start date, etc.) and all information related to PAM PSO monitoring protocols for pile driving and visual PSO protocols for all activities.		
3	C	All vibratory pile driving and removal activities	During all observation periods related to vibratory pile driving or pneumatic hammering, PSOs must use high magnification (25x), standard handheld (7x) binoculars, and the naked eye to search continuously for marine mammals. Sunrise Wind would be required to have a minimum of two PSOs on active duty during any installation and removal of the temporary sheet piles or casing pipe. These PSOs would always be located at the best vantage point(s) on the vibratory pile driving or pneumatic hammering platform or secondary platform in the immediate vicinity of the primary	Marine mammals	NOAA and NMFS

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			platforms in order to ensure that appropriate visual coverage is available of the entire visual clearance zone and as much of the Level B harassment zone as possible. NMFS would not require the use of PAM for these activities. PSOs would monitor the clearance zone for the presence of marine mammals for 30 minutes before, throughout the installation of the sheet piles or casing pipes, and for 30 minutes after the activities have ceased. Sheet pile or casing pipe installation may only commence when visual clearance zones are fully visible (e.g., not obscured by darkness, rain, fog, etc.) and clear of marine mammals, as determined by the lead PSO, for at least 30 minutes immediately prior to initiation of impact or vibratory pile driving.		
4	C	All UXO/MEC detonations.	During all observation periods related to UXO/MEC detonation, PSOs must use high-magnification (25x), standard handheld (7x) binoculars, and the naked eye to search continuously for marine mammals. PSOs located on the UXO/ MEC monitoring vessel((s) would also be equipped with ''big eye'' binoculars (e.g., 25 x 150; 2.7 view angle; individual ocular focus; height control). These would be mounted on a pedestal on the deck of the vessel(s) at the most appropriate vantage to provide for optimal sea surface observation, as well as safety of the PSOs. For detonation zones (based on UXO/ MEC charge weight) larger than 2 km, a secondary vessel would be used for marine mammal monitoring. In the event a secondary vessel is needed, two PSOs would be located at an appropriate vantage point on this vessel and would maintain watch during the same time period as the PSOs on the primary monitoring vessel. For detonation zones larger than 5 km, Sunrise Wind would also be required to perform an aerial survey. At least two PSOs must be deployed on the plane during the aerial survey that would occur before, during, and after UXO/ detonation events. Sunrise Wind	Marine mammals	NOAA and NMFS

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			would be required to ensure that the clearance zones are fully (100 percent) monitored prior to, during, and after detonations. As UXO/MEC detonation would only occur during daylight hours, PSOs would only need to monitor during the period between civil twilight rise and set. All PSOs and PAM operators would be required to begin monitoring 60 minutes prior to the UXO/MEC detonation event, during the event, and after for 30 minutes. Detonation may only commence when visual clearance zones are fully visible (e.g., not obscured by darkness, rain, fog, etc.) and clear of marine mammals, as determined by the lead PSO, for at least 30 minutes immediately prior to detonation. The PAM operator(s) would be stationed on one of the dedicated monitoring vessels but may also potentially be located remotely onshore, although the latter alternative is subject to approval by NMFS. When real-time PAM is used, at least one PAM operator would be designated to monitor each system by viewing the data or data products that would be streamed in real-time or near real-time to a computer workstation and monitor, which would be located either on a Sunrise Wind vessel or onshore. The PAM operator would work in coordination with the visual PSOs to ensure the clearance zone is clear of marine mammals (both visually and acoustically) prior to the detonation. The PAM operator would inform the lead PSO on-duty of any marine mammal detections approaching or within the clearance zones via the data collection software (i.e., Mysticetus or a similar system), who would then be responsible for requesting the necessary mitigation procedure (i.e., delay). The PAM operator would monitor the clearance zone for large whales and beyond the zone as possible (dependent on the detection radius of the PAM monitoring equipment). Sunrise Wind must prepare and submit a UXO/MEC and Marine Mammal Monitoring Plan to NMFS for review and approval at least 180		

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			days before the start of any UXO/MEC. The plans must include final Project design and all information related to visual and PAM PSO monitoring protocols for UXO/MEC detonations.		
5	C	All HRG surveys	• During all observation periods, PSOs must use standard handheld (7x) binoculars and the naked eye to search continuously for marine mammals. • Between four and six PSOs would be present on every 24-hour survey vessel, and two to three PSOs would be present on every 12-hour survey vessel. Sunrise Wind would be required to have at least one PSO on active duty during HRG surveys that are conducted during daylight hours (i.e., from 30 minutes prior to sunrise through 30 minutes following sunset) and at least two PSOs during HRG surveys that are conducted during nighttime hours. • All PSOs would begin monitoring 30 minutes prior to the activation of boomers, sparkers, or CHIRPs; throughout use of these acoustic sources, and for 30 minutes after the use of the acoustic sources has ceased. • Given that multiple HRG vessels may be operating concurrently, any observations of marine mammals would be required to be communicated to PSOs on all nearby survey vessels. • Ramp-up of boomers, sparkers, and CHIRPs would only commence when visual clearance zones are fully visible (e.g., not obscured by darkness, rain, fog, etc.) and clear of marine mammals, as determined by the lead PSO, for at least 30 minutes immediately prior to initiation of survey activities utilizing the specified acoustic sources. • During daylight hours when survey equipment is not operating, Sunrise Wind would ensure that visual PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-	Marine mammals	NOAA and NMFS

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			effort PSO monitoring must be reflected in the monthly PSO monitoring reports.		
6	C	Marine mammal PAM	PAM operators may be on watch for a maximum of 4 consecutive hours followed by a break of at least 2 hours between watches. Again, PSOs can act as PAM operators or visual PSOs (but not simultaneously) as long as they demonstrate that their training and experience are sufficient to perform each task. The PAM system must be monitored by a minimum of one PAM operator beginning at least 60 minutes prior to soft start of impact pile driving of monopiles and UXO/MEC detonation, at all times during monopile installation and UXO/MEC detonation and 30 minutes post-completion of both activities. PAM operators must immediately communicate all detections of marine mammals at any distance (i.e., not limited to the Level B harassment zones) to visual PSOs, including any determination regarding species identification, distance, and bearing and the degree of confidence in the determination. PAM systems may be used for real-time mitigation monitoring. The requirement for real-time detection and localization limits the types of PAM technologies that can be used to those systems that are either cabled, satellite, or radio linked. It is most likely that Sunrise Wind would deploy autonomous or moored-remote PAM devices, including sonobuoy arrays or similar retrievable buoy systems. The system chosen will dictate the design and protocols of the PAM operations. Sunrise Wind is not considering seafloor cabled PAM systems, in part due to high installation and maintenance costs, environmental issues related to cable laying, and the associated permitting complexities. For a review of the PAM systems Sunrise Wind is considering, see Appendix 4 of the PSMMP included in Sunrise Wind's ITA Application. Towed PAM systems may be utilized for the Sunrise Wind Project only if additional PAM systems are necessary. Towed systems consist of cabled	Marine mammals	NOAA and NMFS

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			hydrophone arrays that would be deployed from a vessel and then typically monitored from the tow vessel. Notably, several challenges exist when using a towed PAM system (i.e., the tow vessel may not be fit for the purpose as it may be towing other equipment, operating sound sources, or working in patterns not conducive to effective PAM). Furthermore, detection and localization capabilities for low-frequency cetacean calls (i.e., mysticete species) can be difficult in a commercial deployment setting. Alternatively, these systems have many advantages, as they are often low cost to operate, have high mobility, and are fairly easy and reliable to operate. These types of systems also work well in conjunction with visual monitoring efforts. Sunrise Wind plans to deploy PAM arrays specific for mitigation and monitoring of marine mammals outside of the shutdown zone to optimize the PAM system's capabilities to monitor for the presence of animals potentially entering these zones. The exact configuration and number of PAM devices would depend on the size of the zone(s) being monitored, the amount of noise expected in the area, and the characteristics of the signals being monitored. More closely spaced hydrophones would allow for more directionality and, perhaps, range to the vocalizing marine mammals; however, this approach would add additional costs and greater levels of complexity to the Project. Mysticetes, which would produce relatively loud and lower frequency vocalizations, may be able to be heard with fewer hydrophones spaced at greater distances. However, detecting smaller cetaceans (such as mid-frequency delphinids; odontocetes) may necessitate that more hydrophones be spaced closer together given the shorter propagation range of the shorter, mid-frequency acoustic signals (e.g., whistles and echolocation clicks). As there are no ''perfect fit'' single optimal array configurations, these set-ups would need to be considered on a case-by-case basis.		

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			A Passive Acoustic Monitoring (PAM) Plan must be submitted to NMFS for review and approval at least 180 days prior to the planned start of monopile installations. PAM should follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind (Van Parijs et al., 2021). The plan must describe all proposed PAM equipment, procedures, and protocols. However, NMFS considers PAM usage for every project on a case-by-case basis and would continue discussions with Sunrise Wind regarding selection of the PAM system that is most appropriate for the proposed project. The authorization to take marine mammals would be contingent upon NMFS' approval of the PAM Plan.		
7	C	Acoustic monitoring for sound field and harassment isopleth verification	During the installation of the first three monopile foundations and during all UXO/MEC detonations, Sunrise Wind must empirically determine source levels, the ranges to the isopleths corresponding to the Level A harassment and Level B harassment thresholds, and the transmission loss coefficient(s). Sunrise Wind may also estimate ranges to the Level A harassment and Level B harassment isopleths by extrapolating from in situ measurements conducted at several distances from the monopile being driven and UXO/MEC being detonated. Sunrise Wind must measure received levels at a standard distance of 750 m from the monopiles and at both the presumed modeled Level A harassment and Level B harassment isopleth ranges or an alternative distance(s) as agreed to in the SFV Plan. If acoustic field measurements collected during installation of foundation piles or UXO detonation indicate ranges to the isopleths corresponding to Level A harassment and Level B harassment thresholds are greater than the ranges predicted by modeling (assuming 10 dB attenuation), Sunrise Wind must implement additional noise mitigation measures prior to installing the next monopile or detonating any additional UXOs/MECs. Initial additional measures may	Marine mammals	NOAA and NMFS

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			include improving the efficacy of the implemented noise mitigation technology (e.g., BBC, dBBC) and/or modifying the piling schedule to reduce the sound source. Each sequential modification would be evaluated empirically by acoustic field measurements. In the event that field measurements indicate ranges to isopleths corresponding to Level A harassment and Level B harassment thresholds are greater than the ranges predicted by modeling (assuming 10 dB attenuation), NMFS may expand the relevant harassment, clearance, and shutdown zones and associated monitoring protocols. If harassment zones are expanded beyond an additional 1,500 m, additional PSOs would be deployed on additional platforms with each observer responsible for maintaining watch in no more than 180° and of an area with a radius no greater than 1,500 m. If acoustic measurements indicate that ranges to isopleths corresponding to the Level A harassment and Level B harassment thresholds are less than the ranges predicted by modeling (assuming 10 dB attenuation), Sunrise Wind may request a modification of the clearance and shutdown zones for impact pile driving of monopiles and for detonation of UXOs/MECs. For NMFS to consider a modification request, Sunrise Wind would have had to conduct SFV on three or more monopiles and on all detonated UXOs/MECs thus far to verify that zone sizes are consistently smaller than those predicted by modeling (assuming 10 dB attenuation). In addition, if a subsequent monopile installation location is selected that was not represented by the previous three locations (i.e., substrate composition, water depth), SFV would be required. Furthermore, if a subsequent UXO/MEC charge weight is encountered and/or detonation location is selected that was not representative of the previous locations (i.e., substrate composition, water depth), SFV would also be required. Upon receipt of an interim SFV report, NMFS may adjust zones (i.e., Level A harassment, Level B harassment, clearance, shutdown, and/ or minimum visibility		

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			zone) to reflect SFV measurements. The shutdown and clearance zones for pile driving would be equivalent to the measured range to the Level A harassment isopleths plus 10 percent (shutdown zone) and 20 percent (clearance zone), rounded up to the nearest 100 m (328 ft) for PSO clarity. The minimum visibility zone would be based on the largest measured distance to the Level A harassment isopleth for large whales. Regardless of SFV, a NARW detected at any distance by PSOs would continue to result in a delay to the start of pile driving. Similarly, if pile driving has commenced, shutdown would be called for in the event a right whale is observed at any distance. That is, the visual clearance and shutdown criteria for NARWs would not change, regardless of field acoustic measurements. The Level B harassment zone would be equal to the largest measured range to the Level B harassment isopleth. The SFV Plan must also include how operational noise would be monitored. Sunrise Wind would be required to estimate source levels (at 10 m [33 ft] from the operating foundation) based on received levels measured at 50 m (164 ft), 100 m (328 ft), and 250 m (820 ft) from each foundation monitored (minimum of 3 WTGs and the OCS–DC). These data must be used to identify estimated transmission loss rates. Operational parameters (e.g., direct drive/gearbox information, turbine rotation rate) as well as sea state conditions and information on nearby anthropogenic activities (e.g., vessels transiting or operating in the area) must be reported. Sunrise Wind must submit a SFV Plan at least 180 days prior to the planned start of impact pile driving and any UXO/MEC detonation activities. The plan must describe how Sunrise Wind would ensure that the first three monopile foundation installation sites selected and each UXO/MEC detonation scenario (i.e., charge weight, location) selected for SFV are representative of the rest of the monopile installation sites and UXO/MEC scenarios. Sunrise Wind must include information on how additional sites/scenarios would be selected for SFV should it be		

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			determined that these sites/scenarios are not representative of all other monopile installation sites and UXO/MEC detonations. The plan must also include the methodology for collecting, analyzing, and preparing SFV data for submission to NMFS. The plan must describe how the effectiveness of the sound attenuation methodology would be evaluated based on the results. Sunrise Wind must also provide, as soon as they are available but no later than 48 hours after each installation, the initial results of the SFV measurements to NMFS in an interim report after each monopile for the first three piles and after each UXO/MEC detonation. In addition to the aforementioned monitoring requirements, Sunrise Wind proposes to conduct a long-term ecological monitoring project using bottom-mounted PAM equipment during the effective period of the proposed rule to better understand the long-5term distribution of marine mammals in the Project Area with a focus on detecting NARWs. This long-term study will contribute to the understanding of the potential impacts of the Project and inform any potential adaptive management strategies.		
Other Agency-Proposed Mitigation Measures					
1	C, O&M	Compensation for gear loss and damage	The Lessee shall implement a gear loss and damage compensation program consistent with BOEM's draft guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the OCS Pursuant to 30 *CFR* 585 or as modified in response to public comment.	Commercial and recreational fisheries	BOEM and BSEE
2	C, O&M	Proposed fisheries mitigation measure	No later than 1 year after the approval of the COP, the Lessee shall establish a compensation/mitigation fund (Fund) consistent with BOEM's *Draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf* Pursuant to 30	Commercial and recreational fisheries	BOEM and BSEE

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			CFR 585[1] (Guidance) to compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity resulting from displacement from fishing grounds due to Project construction and operations and to shoreside businesses for losses indirectly related to the Project. For losses to commercial and for-hire recreational fishermen, the Fund shall be based on the revenue exposure for fisheries based out of ports listed in Table 3.14-9. For losses to shoreside businesses, the Lessee shall analyze the impacts to shoreside seafood businesses adjacent to ports listed in Table 3.14-9. Shoreside business impacts may include (but are not limited to): Fishing gear suppliers and repair services; Vessel fuel and maintenance services; Ice and bait suppliers; Seafood processors and dealers; and Wholesale distributors. The Lessee will be required to provide BOEM 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		

[1] Draft Guidance shall be superseded by final Guidance, if final Guidance is published by Project ROD.

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			implementation of the Fund. The Lessee must then submit to BOEM evidence of the implementation of the Fund, including: 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); 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 Documentation regarding the funding account, including the dollar amount, establishment date, financial institution, and owner of the account. [1] Draft Guidance shall be superseded by Final Guidance if final Guidance is published by the Project ROD.		
3	O&M	Mobile gear friendly cable protection measures	Cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure chiefly ensures that seafloor cable protection does not introduce new hangs for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered/sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the Lessee should consider using materials that mirror the benthic environment.	Commercial and recreational fisheries	BOEM, BSEE, DOI
4	C, O&M	Vessel speed restriction	All vessels 65 ft (20 m) or longer subject to the jurisdiction of the U.S. will comply with the 10-knot speed restriction when entering or departing a port or place subject to U.S. jurisdiction, and in any seasonal management area (SMA) during NARW migratory and calving periods from November 1 to April 30" Standard plan: "Between	Marine mammals, sea turtles	BOEM and BSEE

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			November 1 and April 30: Vessels of all sizes will operate port to port (from ports in NJ, NY, MD, DE, and VA) at 10 knots or less between November 1 and April 30 except for vessels while transiting in Narragansett Bay or Long Island Sound which have not been demonstrated by best available science to provide consistent habitat for NARWs. Vessels transiting from other ports outside those described will operate at 10 knots or less when within any active SMA or within the Wind Development Area, including the Sunrise Wind Farm and Sunrise Wind Export Cable. Year Round: Vessels of all sizes will operate at 10 knots or less in any DMAs.		
5	O&M	Cable maintenance plan	BOEM and BSEE would ensure that Sunrise Wind develops a cable maintenance and monitoring plan that outlines a process for identifying when cable burial depths reach unacceptable risks, requires prompt remediation of exposed and shallow-buried cable segments, and includes review to address repeat exposures. The conditions in the SRWEC–NYS Maintenance Plan submitted to the NYSPSC on March 27, 2023 are also generally applicable to those portions of the cable in federal waters.	Navigation and vessel traffic	BOEM and BSEE
6	Pre-C, C, O&M, D	Coordination with federally recognized tribal nations	No later than 90 calendar days after COP approval, the Lessee would contact the federally recognized tribal nations in government-to-government consultations with BOEM for the Project in order to solicit their interest in participating as active monitors on board vessels during construction and/or maintenance activities, participate in postmortem examinations of mortality events as a result of these activities, or have open access to the following: reports generated as a result of the Fisheries Monitoring Plan; reports of NARW sightings; injured or dead protected species reporting (sea turtles and NARWs); NARW PAM monitoring; PSO reports (e.g., pile-driving reports); pile driving schedules and changes to them. At a minimum, the Lessee must offer access to the following federally recognized tribal nations: the	Cultural resources	BOEM and BSEE

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			Mashantucket Pequot Tribal Nation, the Mohegan Tribe of Indians of Connecticut, the Narragansett Indian Tribe, the Mashpee Wampanoag Tribe, The Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Indian Nation, and the Wampanoag Tribe of Gay Head (Aquinnah Delaware Nation; Delaware Tribe of Indians; Stockbridge-Munsee Community Band of Mohican Indians; and Wampanoag Tribe of Gay Head (Aquinnah). The Lessee must provide, in a manner suitable to the tribal nations, access to non-proprietary, non-confidential business information to any federally recognized tribal nation no later than 30 days after the information becomes available. Sunrise Wind is committed to providing a safe working environment and strives to minimize and mitigate all potential hazards. The offshore working environment presents a unique set of circumstances and specialized training is required to ensure the safety and well-being of all people present at the work site. As such, Sunrise Wind's ability to grant requests for access to construction and/or maintenance vessels would depend on several constraints, including Health, Safety, and Environment (HSE) requirements, vessel berthing availability, and applicable insurance liabilities for Project-owned vessels and/or contracted vessels. Furthermore, HSE requirements that apply to those aboard a construction and/or maintenance vessel will include, at minimum, Project-approved trainings for sea survival and a physical examination by a licensed physician. Additional trainings would be required for access to WTGs or to transfer onto the construction vessel itself. Any onboard monitors would also have to commit to the anticipated duration at sea for the vessel's activity (which can be up to 4 weeks) and be limited to the available berthings so as not to impact the availability to construction personnel.		

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7	Pre-C, C	Safety plan, communications plan, and noise mitigation measures	BOEM and BSEE will ensure that Sunrise Wind coordinates with the National Park Service and Fire Island National Seashore in advance of construction activities for the development of the Project's Safety Plan, Communications Plan, and noise mitigation measures for construction activities that could adversely impact NPS areas and noise sensitive areas adjacent to construction activities such as the Otis Pike Fire Island High Dune Wilderness. These plans will consider measures and BMPs included in: U.S. Department of the Interior Director's Order #47: Soundscape Preservation and Noise Management, effective December 1, 2000; NPS Soundscape Management Policy 4.9, effective 2006; and the 1964 Wilderness Act, that states that federal agencies like the NPS are responsible for preserving the wilderness character of wilderness areas, including Opportunities for Solitude or Primitive and Unconfined Recreation.	Noise, recreation and tourism	NPS
8	Pre-C, C	Air emissions	Sunrise Wind would pursue the procurement of the most efficient and lowest emitting vessels available during the vessel contracting stage of the Project. Please note that this mitigation measure is not within BOEM's statutory and regulatory authority but could be adopted and imposed by other governmental agencies.	Air quality	EPA
9	C	Mariner communication plan	In addition to the proposed fisheries communication and outreach plan, and communication plan, Sunrise Wind would coordinate with other mariners, including the commercial shipping industry and recreational users via a mariner communication plan. This plan will include notices when construction, maintenance, and decommissioning activities are scheduled to commence, consultation with stakeholders on approximate schedule of activities in relation to existing uses in the area, and post construction notice of all cable protection measure locations, areas where the identified burial depth of the cable is less than the target burial depth, and other obstructions to navigation created by the Project.	Navigation and vessel traffic	BOEM and BSEE

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			i. Pre-COP consultation with potentially affected stakeholders on initial routing and results of the draft Navigation Safety Risk Assessment; ii. During Project design, coordinating in-water construction activities to avoid and minimize disruptions; iii. At least 90 days prior to commencing in-water construction activities in any construction season, consultation with stakeholders on an approximate schedule of activities and existing uses within the Project Area. Make good faith efforts to accommodate those existing uses. The results of these good faith consultations can be summarized in a report and submitted to the federal agency(ies) prior to the start of each construction season; iv. Following COP approval, notice of proposed changes which have the potential to impact fishing or maritime resources or activities; v. Notices to commence construction activities, conduct maintenance activities, and commence decommissioning; vi. Status reports during construction with specific information on construction activities and locations for upcoming activities in the next 1-2 weeks; vii. Post-construction notice of: (i) all cable protection measure locations (including protection type and charted location); (ii) any areas where the identified burial depth is less than target burial depth; and (iii) other obstructions to navigation created by the Project; and (cont.) viii. Post all notices described above to the Project website with information on how to opt-in for alerts.		
10	O&M	Impingement mortality and entrainment	Sunrise Wind would upgrade and/or retrofit the cooling water intake system (CWIS) to a closed-cycle cooling system if the technology becomes available during Project operations and it is feasible to do so. If it becomes feasible to do so, Sunrise Wind will provide New York	Finfish	EPA

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			State Department of State (NYSDOS) a copy of any National Pollutant Discharge Elimination System (NPDES) Permit Applications and supporting information associated with the CWIS at the time of submittal.		
11	Pre-C, C	Impingement mortality and entrainment	The through-screen velocity of the CWIS will be reduced to below 0.5 feet/second, which is the threshold required for new facilities defined at 40 *CFR* 125.84(c).	Finfish	EPA
12	Pre-C, C	Impingement mortality and entrainment	Sunrise Wind would reduce the CWIS water withdrawal, when feasible, during periods of peak egg and larval abundance within the area affected by the OCS–DC.	Finfish	EPA
13	C	Proposed boulder relocation plan measure	Prior to inter-array cable corridor preparation and cable installation (e.g., boulder relocation, pre-cut trenching, cable crossing installation, cable lay and burial) and foundation site preparation (e.g., scour protection installation), Sunrise Wind would provide BOEM with a boulder relocation plan for implementation. The plan would include the following: 1. Identification of areas of active (within last 5 years) bottom trawl fishing, areas where boulders greater than 2 m (7 ft) in diameter are anticipated to occur, and areas where boulders are expected to be relocated for Project purposes. 2. Methods to minimize the quantity of seafloor obstructions from relocated boulders in areas of active bottom trawl fishing, as identified in #1, as technically or economically feasible. 3. Identification of locations of boulders that would be moved and approximately where they would be place, method(s) for moving boulders, and measures to minimize impacts as technically and economically feasible.	Commercial and recreational fisheries	BOEM, BSEE, and DOI

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			4. Outreach conducted regarding the boulder relocation plan (e.g., notifications to mariners).		
14	C, O&M	Monitoring and reporting	Sunrise Wind will share information that is submitted to BOEM relating to cable burial, monitoring, and protection with DOS (submit to cr@dos.ny.gov and reference DOS files #F-2021-0798/F-2022-0909) that may be included in the Final Design Report/Fabrication and Installation Report, corrective action plan(s), written notification of certain incidents (e.g., vessel collisions, property damage exceeding $25,000), and other reporting requirements such as in connection with the BOEM COP Approval.	Benthic resources	NYSPSC
15	C, O&M, D	Compensatory Mitigation Fund	In addition to avoidance, minimization, and mitigation measures otherwise specified in NYSDOS's decision letters for the Project, Sunrise Wind has agreed to establish a Compensatory Mitigation Fund to provide financial compensation to eligible New York fishermen for mitigating direct losses/impacts to commercial and for-hire (charter) fishing from and caused by the construction, operation, and decommissioning of the Project in federal waters. This agreement, described in the Letter of Intent (LOI) dated August 24, 2023, and executed by both Sunrise Wind and NYSDOS, recognizes that the Draft EIS for the Sunrise Wind Project, Section 3.6.1 identifies certain potential impacts to commercial and for-hire (charter) fishing and its generally aligned with the overall framework set forth in the anticipated final Fisheries Mitigation Guidance from BOEM. Concurrently, with the payment of any compensation claim, the party asserting the claim shall execute a release of liability in favor of Sunrise Wind, and any of its affiliated or related entities and their successors and assigns, from any liability or obligation relating to that particular claim. Sunrise Wind shall not require any fisherman, as a condition of filing a claim, to sign a Non-Disclosure Agreement or waive any right to seek resolution of such claim.	Commercial and for-hire fisheries	NYSPSC

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
16	C, O&M, D	Navigational safety fund	Contribute to an established Navigational Safety Fund (hereafter referred to as the Navigational Enhancement and Training Program [NETP]) to enable New York State commercial fishermen and for-hire vessels to acquire navigation equipment, as defined by the NETP, through a grant or voucher system and provide training and experiential learning opportunities to those navigating within the Ørsted/Eversource joint Venture Wind Lease Areas in the Rhode Island/Massachusetts Wind Energy Area. Sunrise Wind and NYSDOS will work collaboratively to determine the best mechanism for Sunrise Wind to contribute to a NETP. Sunrise Wind has agreed to a NETP amount equivalent to up $13,000 per commercial vessel or inspected charter/party vessel and up to $8,000 per uninspected charter/party vessel. This agreement, described in the Letter of Intent (LOI) dated August 24, 2023, and executed by both Sunrise Wind and NYSDOS, will commit to distribution amounts (1) up to $10,000 for navigation equipment per commercial vessel or inspected charter/party vessel and (2) up to $1,000 per person for training or experiential learning opportunities, with a maximum of three people per vessel.	Navigation	NYSPSC
17	Pre-C, C, O&M, D	Mariner communication and outreach plan	Sunrise Wind will develop and implement a comprehensive Marine Communication and Outreach Plan that covers all Project phases from pre-construction to decommissioning. The proposed fisheries communication and outreach plan will be expanded to include coordination with other mariners, including the commercial shipping industry and other recreational users who would also benefit from this coordination and may not be captured in the currently proposed plan. The mariner communication plan would include the following: • Pre-Construction consultation with potentially affected stakeholders on initial routing and results of the draft Navigation Safety Risk Assessment;	Navigation, recreation and tourism, fisheries	NYSPSC

No.	Proposed Project Phase	Mitigation & Monitoring Measures	Table H-3 Description of Additional Mitigation and Monitoring Measures	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[5]
			• During Project design, coordinating in-water construction activities to avoid and minimize disruptions; • At least 90 days prior to commencing in-water construction activities in any construction season, consultation with stakeholders on an approximate schedule of activities and existing uses within the Project Area. • Following COP approval, notice of proposed changes which have the potential to impact fishing or maritime resources or activities; • Notices to commence construction activities, conduct maintenance activities, and commence decommissioning; • Status reports during construction with specific information on construction activities and locations for upcoming activities in the next 1-2 weeks; and • Sunrise Wind will report fishing gear and anchor strike incidents that fall below or are not captured by the regulatory thresholds outlined in 30 *CFR* 285.832 and 285.833. Reports will be filed annually during construction and decommissioning, and every 5 years during operations.		

H.4. Lessee Authorization and Permit Conditions

Table H-4. Mitigation and Monitoring Conditions During Construction in the National Marine Fisheries Service Proposed Rule Under the Marine Mammal Protection Act

Table H-4 Mitigation and Monitoring Conditions During Construction in the National Marine Fisheries Service Proposed Rule Under the Marine Mammal Protection Act[6]	
Measure	**Purpose**
Noise attenuation through use of a noise mitigation system (impact pile driving)	Reduce the area affected by noise and minimize or avoid impacts to marine mammals.
Protected species observer (PSO) training and equipment requirements	Increase the effectiveness of PSOs to implement certain mitigations and minimize or avoid impacts to marine mammals.
Visual monitoring: including low visibility monitoring tools during pile driving (impact pile driving)	Increase the effectiveness of PSOs to implement certain mitigations and minimize or avoid impacts to marine mammals.
Passive acoustic monitoring during pile driving (impact pile driving)	Increase the effectiveness of PSOs to implement certain mitigations and minimize or avoid impacts to marine mammals.
Establishment and monitoring of shutdown zones (impact pile driving)	Increase the effectiveness of PSOs to implement certain mitigations and minimize or avoid impacts to marine mammals.
Shutdown procedures (impact pile driving)	Implement mitigations to minimize or avoid impacts to marine mammals when they are detected.
Pre-start clearance and post-activity monitoring (impact pile driving)	Implement mitigations to minimize or avoid impacts to marine mammals when they are detected.

[6] See the full description of the proposed mitigation measures from the National Marine Fisheries Service in the proposed rule letter of authorization under the Marine Mammal Protection Act (February 10, 2023, 88 Federal Register 8996)

Table H-4
Mitigation and Monitoring Conditions During Construction in the
National Marine Fisheries Service Proposed Rule Under the Marine Mammal Protection Act[6]

Measure	Purpose
Acoustic monitoring (impact pile driving)	Implement mitigations to minimize or avoid impacts to marine mammals when they are detected.
Pre-start clearance (impact pile driving)	Implement mitigations to minimize or avoid impacts to marine mammals when they are detected.
Pile driving shutdown zones (impact pile driving)	Implement mitigations to minimize or avoid impacts to marine mammals when they are detected within specified shutdown zones.
Soft start (impact pile driving)	Slowly increase noise levels to provide an opportunity for animals to leave the area before full pile driver power is achieved. Implement mitigations to minimize or avoid impacts to marine mammals when they are detected during soft starts.
Sound source measurements	Monitoring of the effectiveness of the predicted shutdown zones to minimize or avoid impacts to marine mammals.
Marine mammal separation distances and seasonal management area (SMA) compliance	Avoid striking marine mammals
North Atlantic right whale situational awareness	Avoid striking marine mammals
Vessel strike avoidance	Avoid striking marine mammals
Adaptive vessel speed plan	Avoid striking marine mammals by implementing speed restrictions when whales are detected.
Passive acoustic monitoring network to support speed restrictions outside of SMAs	Avoid striking marine mammals by implementing speed restrictions when whales are detected.
Data recording	Information collected to report on the effectiveness of mitigation to avoid or minimize effects to marine mammals.
Reporting	Reporting on the effectiveness of mitigation to avoid or minimize effects to marine mammals
Monitoring equipment	Minimize impact pile driving effects
Visual monitoring	Minimize impact pile driving effects

Table H-4
Mitigation and Monitoring Conditions During Construction in the
National Marine Fisheries Service Proposed Rule Under the Marine Mammal Protection Act[6]

Measure	Purpose
Daytime visual monitoring	Minimize impact pile driving effects
Daytime visual monitoring during periods of low visibility	Minimize impact pile driving effects
Nighttime pile driving	Minimize impact pile driving effects
Acoustic monitoring	Minimize impact pile driving effects
Shutdown zones	Minimize impact pile driving effects
Pre-start clearance	Minimize impact pile driving effects
Soft start	Minimize impact pile driving effects
Shutdowns	Ensure that modeled isopleths used to establish clearance and shutdown zones and estimate marine mammal take are accurate
Sound Measurements	Minimize vibratory pile driving effects
Unexploded ordinance/munitions and explosives of concern disposal	Minimize pile driving effects
Monitoring and reporting	Minimize pile driving effects

Table H-5. National Pollutant Discharge Elimination System Permit No. MA0004940 Draft

Table H-5 National Pollutant Discharge Elimination System Permit No. MA0004940 Draft Special Conditions Final Decision Target Date: March 2024
Description
1. Discharges of Chemicals and Additives The discharge of any chemical or additive, including chemical substitution that was not reported in the application submitted to Environmental Protection Agency (EPA) or provided through a subsequent written notification submitted to EPA is prohibited. Upon the effective date of this Permit, chemicals and/or additives that have been disclosed to EPA may be discharged up to the frequency and level disclosed, provided that such discharge does not violate §§ 307 or 311 of the Clean Water Act. Discharges of a new chemical or additive are authorized under this Permit 30 days following written notification to EPA unless otherwise notified by EPA. To request authorization to discharge a new chemical or additive, the Permittee must submit a written notification to EPA in accordance with Part I.D.3 of this Permit. The written notification must include the following information, at a minimum: a. The following information for each chemical and/or additive that will be discharged: 1) Product name, chemical formula, general description, and manufacturer of the chemical/additive; 2) Purpose or use of the chemical/additive; 3) Safety Data Sheet (SDS) and Chemical Abstracts Service Registry number for each chemical/additive; 4) The frequency (e.g., hourly, daily), magnitude (i.e., maximum application concentration), duration (e.g., hours, days), and method of application for the chemical/additive; 5) If available, the vendor's reported aquatic toxicity (i.e., NOAEL and/or LC50 in percent for aquatic organism(s)). b. Written rationale that demonstrates that the discharge of such chemicals and/or additives as proposed: 1) will not add any pollutants in concentrations that exceed any permit effluent limitation; and 2) will not add any pollutants that would justify the application of permit conditions different from, or in addition to those currently in this Permit. 2. Cooling Water Intake Structure (CWIS) Requirements The design, location, construction, and capacity of the CWIS shall reflect the best technology available (BTA) for minimizing adverse environmental impacts from the impingement and entrainment of all life stages of fish (e.g., eggs, larvae, juveniles, and adults) by the CWIS. Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act. The following requirements have been determined to represent the BTA for minimizing impingement and entrainment at this facility: a. Permittee must design, construct, and operate the CWIS with a design through-screen intake velocity no greater than 0.5 feet per second. The Permittee must monitor velocity at the point of entry through the CWIS and report the maximum actual through-screen velocity in the monthly discharge monitoring report. See Part I.A.1 of the Permit.

Table H-5
National Pollutant Discharge Elimination System Permit No. MA0004940 Draft Special Conditions
Final Decision Target Date: March 2024

Description
b. The Permittee must operate variable frequency drives on the seawater lift pumps to achieve a maximum daily intake flow of 7.8 million gallons per day (MGD) and a maximum average monthly flow of 5.3 MGD.
c. The CWIS must be located at a depth between 30 to 50 feet (9 to 15 meters) above pre-construction seafloor grade.
d. The Permittee shall conduct weekly visual inspections or employ remote monitoring devices to ensure that any design and construction technologies required as the BTA for the CWIS are maintained and continue to function as designed.
Ambient Monitoring
a. Biological Monitoring The Permittee must conduct biological monitoring in accordance with the study design specified in Attachment A to this Permit. At a minimum, biological monitoring must be conducted over a 48-hour period each quarter at two depth zones: within the estimated Hydraulic Zone of Influence of the CWIS and the full water column. Sampling must begin the first year of full-scale operation to verify the performance of the technologies and operational measures to minimize adverse environmental impact. After 4 years of monitoring, the Permittee may request a reduction in monitoring frequency. Monitoring must continue as specified in the Permit until written authorization by EPA is received.
b. Thermal Monitoring The Permittee must conduct an ambient thermal monitoring program in accordance with the study design specified in Attachment A to the National Pollutant Discharge Elimination System (NPDES) Permit. Ambient thermal monitoring must be conducted during spring of the second year of full-scale operation to verify the assumptions of the thermal model and document the extent of the thermal plume.
c. Ambient Monitoring Reports The Permittee shall submit an annual report summarizing the results of the ambient monitoring effort no later than March 15 of the following year. The report shall summarize the daily and monthly effluent flow at the offshore converter station, the results of the biological monitoring as required in (a), and, when applicable, the results of the thermal monitoring as required in (b). The Permittee must submit electronic copies of this report and provide the corresponding data in .csv or .xlsx format to the NPDES Applications Coordinator as provided in Part I.D.3.

Table H-6. New York State Department of Public Service Article VII Environmental Management and Construction Plan Phase 1

Table H-6 New York State Department of Public Service Article VII Environmental Management and Construction Plan Phase 1 Approved June 23, 2023[7]	
No.	**Description**
1	The Environmental Management and Construction Plan for Phase 1 construction (Phase 1 EM&CP) submitted by Sunrise Wind LLC (Certificate Holder) on November 18, 2022, and supplemented and revised on February 14, March 14, March 15, March 23, May 26, and June 13, 2023, is approved subject to the following conditions.
2	At least 10 days prior to any construction activity within 2 feet, 10 inches of KeySpan Gas East Corporation d/b/a National Grid's existing gas pipeline, the Certificate Holder shall submit to New York State Department of Public Service staff a statement or other document(s) confirming agreement between the Certificate Holder and KeySpan Gas East Corporation d/b/a National Grid on the location, alignment, and construction and installation methods for the relevant portion of the facility.
3	Construction of the onshore converter station foundation is approved as part of Phase 1 construction. If for any reason, including to comply with Certificate Conditions applicable to noise, the final design of the onshore converter station or its components require any modification of the foundation, Sunrise Wind shall provide details of the proposed modifications as part of the Phase 2 EM&CP.
4	The Certificate Holder shall not commence construction until it has received a "Notice to Proceed with Phase 1 Construction" letter sent by the Chief of Environmental Certification and Compliance of the Office of Energy System Planning and Performance, or by a designee.
5	This proceeding is continued.

[7] {10B1E888-0000-CE14-9DA0-B8DFC367267A}.pdf

Table H-7. New York State Department of Public Service Water Quality Certification

Table H-7 New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]	
No.	**Description**
1	No in-water work shall commence until all pre-constructions relating to such work contained in the Certificate of Environmental Compatibility and Public Need (CECPN) in Case 20-T-0617 have been met to the satisfaction of the New York State Department of Public Service
2	Construction, operation, maintenance, repair and decommissioning of the Project shall at all times be in conformance with (a) the Application and Joint Proposal in Case 20-T- 0617 (as amended and supplemented), to the degree not superseded by the CECPN; (b) all conditions of approval contained in the CECPN; (c) the approved Environmental Management and Construction Plan(s) (EM&CP); and (d) all conditions incorporated in any order approving the EM&CP or any revisions to the EM&CP required by the CECPN in Case 20-T-0617, to the extent such documents referenced in (c) and (d) above pertain to Sunrise Wind's compliance with the New York State Water Quality Standards necessary and appropriate for issuance of, and compliance with, this Water Quality Certification (Certification).
3	Sunrise Wind shall provide a copy of this Certification to the United States Army Corps of Engineers (USACE) along with a copy of the Application, the Joint Proposal, CECPN, and the EM&CP so that the USACE will have a complete record of the conditions that apply hereto.
4	Sunrise Wind shall provide to all construction contractors performing work on the Project complete copies of this Certification, the Joint Proposal, the CECPN, and the EM&CP.
5	Sunrise Wind shall provide notification to the New York State Department of Public Service, concurrently with USACE, if any updates, proposed changes, alterations, or modifications are requested to the §404 Clean Water Act Permit or Permit Application, so that the New York Department of Public Service (NYSDPS) will have a complete record of impacts to water resources, including mitigation, that may affect State water quality standards.
6	All drilling fluid additives must be water-based unless otherwise approved by NYSDPS in consultation with New York State Department of Environmental Conservation (NYSDEC). If a polymer-based additive is proposed, it must be included in the EM&CP with the corresponding Safety Data Sheet containing ecotoxicity information and approved NYSDEC Water Treatment Chemical Form. Petroleum-based additives are strictly prohibited. If a polymer-based additive is proposed, Sunrise Wind will propose to use a biodegradable polymer-based additive if a suitable product exists.

[8] {400FFB89-0000-C319-AA5D-EAC2F2A8DB05} (1).pdf

Table H-7 New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]	
No.	**Description**
7	Water quality standards set forth in 6 *New York Codes, Rules, and Regulations (NYCRR)* Parts 701, 702, 703, 704, 750 and sections 301, 302, 303, 306, and 307 of the federal Clean Water Act (see 33 *USC* §§ 1311, 1312, 1313, 1313a, and 1317) shall not be contravened. Issuance of a Water Quality Certification also implies compliance with standards assuming that conditions placed in the certification are complied with. • Water Quality Standard: None from sewage, industrial waste or other wastes that will cause deposition or impair the waters for their best usages.
8	A pre-activity water quality calibration will be conducted to ensure that total suspended solids (TSS) may be accurately estimated in real-time during water quality monitoring activities. The pre-activity water quality calibration will be described in detail in the suspended solids and water quality monitoring plan.
9	The following limit must be achieved for TSS at a distance of 1,500 feet (ft; 457 meters [m]) down current (based on tide direction) of sediment disturbing activities: • Guidance Value: TSS 100 mg/L above ambient for all offshore construction activities. • If during water quality monitoring, the real-time TSS concentrations established by the calibration curves exceed the TSS limits established in this Certificate, NYSDPS, NYSDEC, and the Aquatic Environmental Monitor shall be immediately notified and work shall be ceased immediately and then restarted at modified levels that will reduce TSS levels and bring them into compliance with Condition 192 (a) (b) in accordance with iterative changes outlined in Condition 192 (c) (ii) and (iii). Sunrise Wind will continue to iteratively implement operational controls and measure the resulting TSS. Sunrise Wind will notify the Aquatic Monitor throughout the process about any such operational adjustments. • During implementation of corrective actions, NYSDPS and NYSDEC may specify additional monitoring until compliance with Water Quality Standards is demonstrated. Samples shall be collected until resumption of routine monitoring is authorized by NYSDPS in consultation with NYSDEC. ○ For purposes of iterative changes to the use of a controlled flow excavation (CFE) or hand jetting tools, the following changes may be employed: changing the rate of advancement of the CFE or hand jet tool, modifying or varying hydraulic jetting pressures, and/or implementing other reasonable operational controls that may reduce suspension of in-situ sediments in a manner that would not materially delay the progress of work to complete the installation procedure. ○ For purposes of iterative changes to the use of a barge mounted excavator, the following changes may be employed: changing the rate of advancement of the excavator, modifying the depth of the excavator bucket in the water column, implementing other reasonable operational controls that may reduce suspension of in-situ sediments in a manner that would not materially delay the progress of work to complete the installation procedure, operate the bucket so as to control the rate of the descent and to maximize the depth of penetration without overfilling the bucket, and/or to control bucket retrieval rates.

Table H-7 New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]	
No.	**Description**
10	Visual observations of turbidity will be identified in the applicable EM&CP caused by underwater cable and horizontal directional drilling (HDD) exit pit installation/backfill activities, pre-lay grapnel run operations, maintenance, and decommissioning activities must be conducted to ensure compliance with the narrative water quality standard in 6 *NYCRR* § 703.2: "No increase that will cause a substantial visible contrast to natural conditions."
11	Sunrise Wind shall incorporate within the EM&CP and implement a Suspended Sediment and Water Quality Monitoring Plan pertaining to offshore and onshore activities. Sunrise Wind must submit a Suspended Sediment and Water Quality Monitoring Plan for review and comment by NYSDPS, NYSDEC, and New York State Department of State (NYSDOS) 45 days prior to the filing of the EM&CP. The Suspended Sediment and Water Quality Monitoring Plan must be prepared in accordance with the "Scope of Study: Suspended Sediment/Water Quality Monitoring" attached as Appendix I of the Joint Proposal. • Water quality monitoring shall be conducted within the Project Corridor as described in Appendix B during seabed preparations, jet trenching pre- construction and construction activities, excavation of the HDD exit, pre- lay grapnel run, cable installation, backfill of the HDD exit, sand wave leveling, and maintenance and decommissioning activities that involve disturbance of sediments (together, "Monitored Construction Activities"). • Maintenance and decommissioning activities that result in only minor disturbance of sediments, including: (i) anchor sweep; (ii) anchoring; (iii) placement of jack-up barge; (iv) hand jetting; or (vi) other activities as determined by NYSDPS, in consultation with NYSDEC, shall not require water quality monitoring.
12	If any jet trenching technology is used to lay the cable, trials must be conducted within representative sections or areas proximate to the proposed underwater cable route in New York State waters prior to cable installation to ensure compliance with TSS threshold limits as defined in Condition 187 (a). The trial will include approximately 1,000 ft (305 m) of jet trenching operations within an area to be specified in the Jet Trencher Trial Plan that will be submitted as part of the EM&CP. The following conditions apply to jet trencher trials: • Pre-monitoring water quality calibration will be conducted prior to the jet trencher trails and will enable real-time estimation of TSS concentrations during the trials. • A combination of acoustic (ADCP) and calibrated optical backscatter (OBS) measurements will be used to estimate TSS concentrations on selected transects. TSS and OBS turbidity water samples will be collected 1,500 ft (457 m) up-current (for baseline) and 1,500 ft (457 m) down-current of the jet plow, at three interval depths (near surface, mid-depth, and near bottom) and analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. Water quality monitoring requirements during jet trencher trials will be described in detail in the suspended solids and water quality monitoring plan. • Sunrise Wind must coordinate with NYSDPS and NYSDEC to share real-time TSS measurement estimates collected during the jet trencher installation trials to evaluate whether the operating conditions result in TSS concentrations that exceed the TSS threshold limit.

Table H-7 New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]	
No.	**Description**
	• If the jet trencher trials demonstrate that the operating conditions result in TSS concentrations that exceed the TSS threshold limit established herein, Sunrise Wind notify NYSDPS and NYSDEC and implement feasible modifications to the jet trencher operating conditions to further reduce in-situ sediment resuspension associated with the jet trencher installation procedure. • Jet trencher operations may proceed after Jet Trencher Trial results are reviewed in real-time and accepted by NYSDPS and NYSDEC. Review of this information by NYSDPS and NYSDEC shall not unreasonably delay the commencement of installation of the underwater cable system. (Certificate Condition 188).
13	The following conditions apply if jet trenching technology is used to install the Onshore Sunrise Wind Export Cable (SRWEC–NYS): • Sunrise Wind must operate the jet trencher in accordance with the operating conditions determined through jet trencher trials to maintain the suspension of in-situ sediments within the TSS limits. • If, during jet trencher installation of the cable, TSS concentrations exceed the TSS limits established in this Certificate, Sunrise Wind shall follow the process established in Conditions 188 and 189 (c). • For purposes of iterative changes to the use of the jet trencher, the following changes may be employed: changing the rate of advancement of the jet trencher, modifying or varying hydraulic jetting pressures, and/or implementing other reasonable operational controls that may reduce suspension of in-situ sediments in a manner that would not materially delay the progress of work to complete the jet trencher installation procedure.
14	The following conditions shall be applied to minimize sediment released into the water column during the Landfall HDD conduit installation: • The environmental monitor shall inspect all installation equipment to be utilized at the offshore terminus point of the Landfall HDD prior to use and shall perform periodic inspections of all such equipment no less than once per week when in use. • Sunrise Wind shall: ○ only use equipment in good operating condition; ○ only use equipment fit for purpose; ○ operate the equipment to satisfy TSS guidance value described in Condition 187; ○ not use a dragline for excavation; ○ demonstrate to the environmental monitor that the equipment operator has sufficient control over the bucket operation so that the sediment re- suspension from bucket contact with the bottom and bucket overfilling is minimized; ○ utilize bucket excavation unless bucket excavation would endanger the HDD borehole, in which case Sunrise Wind may use airlift, CFE, and/or suction dredging methodologies to install the HDD conduit and the SRWEC–NYS cable; and

Table H-7
New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]

No.	Description
	○ during excavation and backfill of at the offshore HDD exit pit, provide to NYSDPS, NYSDEC, NYSDOS weekly progress reports that demonstrate compliance with Certificate requirements and such other information as determined necessary based on consultation with NYSDPS, NYSDEC, and NYSDOS. • Sunrise Wind may install permanent concrete mattresses or rock bags for protection of the conduit and/or cable within the offshore HDD exit, provided that Sunrise Wind shall cover such protection measures with at least 3 ft (1 m) of material excavated from the HDD exit or similar material from upland sources and ensure that there is no discernible depression consistent with Condition 196 (d). Additional details regarding such cable protection measures shall be provided in the EM&CP. Prior to filing the EM&CP, Sunrise Wind shall consult with NYSDPS, NYSDEC, and NYSDOS regarding cable protection measures. • No later than 3 months following the Commercial Operation Date, exclusive of the construction windows described herein, Sunrise Wind shall determine whether there is a discernible depression at the offshore HDD exits. If there is a discernable depression, Sunrise Wind will timely backfill the HDD exits unless, in consultation with NYSDPS and NYSDEC, it is determined backfill is not necessary.
15	The offshore conduit end of the SRWEC–NYS may be exposed or buried by means of hydraulic or mechanical dredging. Material needed for cover of the Landfall HDD conduit end will be placed adjacent to the Landfall HDD conduit location for later use as cover material. Material placement will be done to minimize the footprint of the reverse backfill material and Sunrise Wind will minimize the sediment removed from the offshore HDD exit to the maximum extent practicable. If material to be dredged is contaminated, prior to dredging, Sunrise Wind shall identify the final dredged material disposal location, including a letter from the permitted disposal facility verifying that they will accept the material. • All contaminated material shall be handled in accordance with details provided in the EM&CP and below: ○ only use equipment in good operating condition; ○ not use deck barges, unless modified to allow no barge overflow and as approved by the environmental monitor and NYSDPS in consultation with NYSDEC; ○ use barges or scows of solid hull construction or which are sealed; ○ use a closed (i.e., sealed) environmental (e.g., clamshell) bucket with sealing gaskets or an overlapping sealed design at the jaws and seals or flaps positioned at locations of vent openings to minimize sediment suspension; ○ ensure that seals or flaps designed or installed at the jaws and locations of vent openings tightly cover these openings while the bucket is lifted through the water column and into the barge; ○ equip the closed environmental (e.g., clamshell) bucket with sensors to ensure complete closure of the bucket before lifting through the water;

Table H-7 New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]	
No.	**Description**
	○ operate the bucket so as to control the rate of the descent and to maximize the depth of penetration without overfilling the bucket; ○ control bucket retrieval rates to minimize turbidity; ○ lower the bucket to the level of the barge gunwales prior to release of the load and place the excavated material deliberately and in a controlled manner; ○ suspend operations until any necessary repairs or replacements are made when a significant loss of water and visible sediments from the bucket is observed; ○ avoid washing the gunwales of the scow except to the extent necessary to ensure the safety of workers; ○ not overflow the barge; ○ Sunrise Wind shall allow a minimum of 24 hours of settlement prior to decanting barges. Decanting of barges may not commence until approved by NYSDPS, in consultation with NYSDEC; and ○ operate the equipment so as to minimize sediment transport.
16	Relevant Species Related Work Restrictions • Atlantic sturgeon. No in-water seabed disturbing work, including jet trenching trials, but not including installation and decommissioning or operation of the Equipment (as defined in Conditions 75 [d] and 81), shall occur between May 1 to June 30 and September 1 to November 30 in any year to avoid the risk for incidental take of Atlantic sturgeon, except that Sunrise Wind may be permitted to perform the following, limited seabed disturbing work activities diver clearance and maintenance in HDD exit to locate and prepare HDD conduit end using a crane-deployed, diver-operated jetting tool; cable pull through HDD conduit; and backfill of the HDD exit with sediment or appropriate secondary protection between May 1 through May 15 and November 1 through November 30. In addition, between November 1 and November 30, Sunrise Wind shall be authorized to position and anchor vessels and place the jack-up barge or similar supporting vessel to be used in connection with HDD Drilling Operations, however, the in-water punch out will not occur prior to November 30. If backfill of the HDD exit or remedial burial/secondary cable protection installation and defect remedy occurs during the restricted window (May 1 to June 30 or September 1 to November 30, Sunrise Wind shall develop an Atlantic Sturgeon Monitoring and Impact Minimization Plan. Such Atlantic Sturgeon Monitoring and Impact Minimization Plan must meet the substantive requirements of 6 *NYCRR* Part 182, and shall be included as part of the EM&CP. If applicable, Sunrise Wind shall provide the Atlantic Sturgeon Monitoring and Impact Minimization Plan to NYSDEC 45 days prior to filing of the EM&CP for NYSDEC's review and comment. • Winter Flounder: Aside from the activities outlined herein, no in-water seabed disturbing activities shall occur in the intracoastal waterway (ICW) between December 15 and May 31 ("Winter Flounder restricted window") in any year. This time of year, restriction will not prevent Sunrise Wind from installing or decommissioning temporary, in-water equipment or structures in the ICW (the Equipment, see also Certificate Condition 81) to facilitate the construction of the Project within the Winter Flounder restricted window

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New York State Department of Public Service Water Quality Certification Issued August 15, 2023[8]

No.	Description
	in any year during construction of the Project. If installation or decommissioning of the Equipment occurs during the Winter Flounder restricted window, Sunrise Wind shall develop a Winter Flounder Monitoring and Minimization Plan in consultation with NYSDEC. Sunrise Wind shall provide the Winter Flounder Monitoring and Minimization Plan to NYSDEC 45 days prior to filing of the EM&CP for NYSDEC's review and comment. If, in consultation with NYSDEC, it is determined that the Equipment will result in the wake of Winter Flounder, then Sunrise Wind shall implement a Winter Flounder Net Conservation Benefit Plan (NCBP) that meets the requirements of 6 *NYCRR* Part 182. The Winter Flounder NCBP, if necessary, shall be submitted to NYSDEC for review and acceptance prior to filing with the Secretary and Commencement of Construction in the relevant area.
17	Exclusive of the portion of the cable installed via HDD, Sunrise Wind shall install the SRWEC–NYS a minimum of 6 ft (1.8 m) (measured from top of cable) below the seabed (target burial depth). Should the target burial depth not be achieved during the initial pass of the cable installation tool that is best suited to achieve target burial depth, Sunrise Wind shall perform up to two additional passes with the installation tool, or other burial tool that complies with the requirements of the Certificate, unless (a) additional passes risk causing damage to the SRWEC–NYS or the installation tool; or (b) due to geologic obstructions, additional passes would not increase the burial depth or risk causing cable exposure (actual burial depth). Sunrise Wind shall use best efforts to micro-route the cable within the cable corridor to achieve target burial depth during installation. If boulders are not identified during pre-construction surveys, and therefore micro-routing the cable is impracticable, Sunrise Wind shall, if required to increase the likelihood of achieving target burial depth, relocate any encountered boulders within 50 ft (15 m) of the planned centerline of the cable. Where Sunrise Wind has relocated a boulder 3 ft (1 m) or more in diameter a distance of 6.5 ft (2 m) or more from the location where it was initially encountered, Sunrise Wind shall provide electronic notice to mariners, recreational fishermen, and NYSDEC-Licensed Fishermen in accordance with Appendix J. The SRWEC–NYS shall be maintained in accordance with the Cable Monitoring and Management Plan included in the approved EM&CP.

Table H-8. New York State Department of Public Service Article VII Certificate of Environmental Compatibility and Public Need

Table H-8 New York State Department of Public Service Article VII Certificate of Environmental Compatibility and Public Need Issued November 17, 2022[9]
A. **Conditions of the Order**
1. Subject to the conditions set forth in this Opinion and Order, Sunrise Wind LLC (Certificate Holder) is granted a Certificate of Environmental Compatibility and Public Need (Certificate) pursuant to Article VII of the Public Service Law (PSL) authorizing the construction and operation of an underground electric transmission system consisting of: (i) one high-voltage direct current (DC) submarine export cable bundle (320 kilovolt [kV]) up to 5.2 miles (mi; 8.4 kilometers [km]) in length in New York State waters and up to 1,054 feet (ft) (321 meters [m]) located onshore (i.e., above the mean high water line [MHWL], as defined by the United States Army Corps of Engineers [USACE] [33 *Code of Federal Regulations (CFR)* 329]) and underground, up to the transition joint bay (TJB) (the SRWEC–NYS); (ii) a DC underground transmission circuit (320 kV) up to 17.5 mi (28.2 km) in length primarily within existing roadway rights-of-way (ROW) and concrete and/or direct buried splice vaults and associated components (the onshore transmission cable); (iii) an onshore converter station that will transform the Project's voltage from 320 kV to 138 kV alternating current (AC) (the OnCS–DC); (iv) two AC underground circuits (138 kV) approximately 1.1 mi (1.7 km) in length, which will connect the new OnCS–DC to the existing Holbrook Substation (the onshore interconnection cable); (v) fiber optic cables co-located with both the onshore transmission cable and onshore interconnection cable; (vi) laydown yards; and (vii) the expansion of the Holbrook Substation to accept the onshore interconnection cable (the Holbrook Substation Expansion). The SRWEC–NYS, onshore transmission cable, OnCS–DC, onshore interconnection cable, fiber optic cables, laydown yards, and the Holbrook Substation Expansion shall collectively be referred to herein as the "Project." The transition of the SRWEC–NYS to the onshore transmission cable will occur where the cables are spliced together at the TJB and link boxes located at the work area within Smith Point County Park on Fire Island in the Town of Brookhaven (the Town) (the Landfall Work Area). 2. For purposes of the Certificate Conditions, "Project Corridor" shall be defined as the area in which Certificate Holder is authorized to construct, operate, maintain, repair, and decommission the Project, including any temporary laydown yards and work areas. The Project shall be located within the Project Corridor, which is shown on the maps included in Appendix B to the Joint Proposal. The Certificate Holder shall confine construction, operation, maintenance, repair, and decommissioning activities to the Project Corridor. The SRWEC–NYS route may deviate from where it is shown within the Project Corridor maps included in Appendix B but the Project Corridor may not be expanded without amending the Certificate.

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Table H-8 New York State Department of Public Service Article VII Certificate of Environmental Compatibility and Public Need Issued November 17, 2022[9]
3. The Certificate and these Certificate Conditions shall apply only to the Project, which is wholly located within the jurisdictional boundaries of the State of New York.
4. The Certificate Holder shall, within 30 days after the issuance of the Certificate, file with the Secretary (the Secretary) of the Public Service Commission (the Commission) either a petition for rehearing or a verified statement that it accepts and will comply with the Certificate. Failure to comply with this Condition shall invalidate the Certificate.
5. The Certificate Holder shall notify the Secretary in writing should they decide not to complete construction of all or any portion of the Project within 30 days of reaching such a decision and shall serve a copy of such notice upon all parties to this proceeding (the Proceeding).
6. The Certificate Holder shall construct the Project in accordance with this Certificate, the approved Environmental Management and Construction Plan (EM&CP), which may be approved in phases (each, a "Phase"), and any subsequent Commission order.
7. The Certificate Holder shall further detail the construction and monitoring plans within the Project Corridor in the EM&CP. The Project's EM&CP will have an initial phase (Phase 1) and a subsequent phase(s) (any, post-Phase 1). The portions of the Project that will be included in the Phase 1 EM&CP are described in Appendix G to the Joint Proposal.
8. For purposes of this Certificate, "Commencement of Construction" shall be defined as: the beginning of unlimited and continuous tree clearing, site clearing, ground disturbance, site preparation (except installation of temporary erosion and sedimentation control measures), and grading activities related to installation of the Project. Commencement of Construction does not include: (1) soil or groundwater testing, surveying (such as geotechnical drilling), or similar pre-construction activities undertaken to determine the adequacy of the Project Corridor for construction and the preparation of filings pursuant to the Certificate; and (2) other activities, such as limited staging and limited tree cutting required to perform such pre-construction activities. a. Certificate Holder will file any agreements or plans, including safety measures, it has entered into or agreed to with the Long Island Rail Road (LIRR) prior to the commencement of post-Phase 1 construction. b. Prior to the preparation and use of each laydown yard, the Certificate Holder shall file with the Secretary appropriate Phase 1A and/or Phase 1B survey results, and documentation, if any is provided to Certificate Holder, of the State Historic Preservation Office (SHPO) determination of no adverse effect, or a copy of an executed mitigation agreement between the Certificate Holder and SHPO, if adverse effects cannot be avoided.
9. The Commencement of Construction shall not begin for any portion of the Project before the Commission has approved the applicable Phase of the EM&CP.
10. If the Commencement of Construction of the Project does not begin within the later of 18 months after the Commission approves the EM&CP or Certificate Holder receives all applicable federal permits and approvals, the Certificate may be vacated by the Commission with notice to the Certificate Holder and all parties. The Certificate Holder shall be excused from this requirement during the length of any force majeure event and may request an extension of this deadline. Any request for an extension must be in writing, include a justification for the extension, and be filed with the Secretary at least one day prior to the affected deadline.

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B. **Laws and Regulations**

11. Each substantive federal, State, and local law, regulation, code, and ordinance applicable to the Project shall apply, except to the extent that the Commission has expressly refused to apply any substantive local law or regulation as being unreasonably restrictive.

12. No State or local legal provision purporting to require any approval, consent, permit, certificate, or other condition for the construction or operation of the Project authorized by the Certificate shall apply, except: (i) those of the PSL, including but not limited to Sections 68, 69, and 70, and regulations and orders adopted thereunder; (ii) those provided by otherwise applicable State law for the protection of employees engaged in the construction and operation of the facilities; and (iii) those permits issued under a federally-delegated or pursuant to federally-approved environmental permitting program, or federal consistency review pursuant to the federal Coastal Zone Management Act.

13. The Certificate Holder shall construct the Project in a manner that conforms to all applicable national and international electrical standards. Upon completion of the Project, the Certificate Holder shall file a letter with the Secretary certifying that the Project was constructed in full conformance with the National Electric Safety Code.

14. Nothing herein shall preclude the Certificate Holder from voluntarily subjecting itself to applicable State or local approval, consent, permit, certificate, or other condition for the construction or operation of the Project, subject to the Commission's ongoing jurisdiction.

15. The Certificate Holder shall apply for a New York State Department of Transportation (NYSDOT) highway work permit (Highway Work Permit) and use and occupancy agreement pursuant to Title 17 of New York Codes, Rules, and Regulations (*NYCRR*) Parts 126, 127 and 131 and NYS Highway Law Section 52 for construction and operation of any portion of the onshore transmission cable in NYSDOT-owned ROW, subject to the Commission's ongoing jurisdiction.

16. The Certificate Holder shall not commence work on any Phase until it obtains all required interests in real estate, including interests in real estate to be used for access roads (whether obtained through a conveyance, consent, permit, or other approval) as are necessary and applicable for such Phase. Confirmation of obtaining such interests shall be provided to the Secretary prior to commencement of the work. The Certificate Holder acknowledges that, consistent with Certificate Condition 12, it will secure any necessary approvals under PSL Section 68 before commencement of any such work.

17. The Certificate Holder shall not commence Phase 1 work prior to the State's approval of parkland alienation necessary to construct the entire Project, which includes land at the Smith Point County Park and Southaven County Park, and any necessary Federal Highway Administration approval and any other permit or approval necessary for construction in those areas unless otherwise described below.

a. The Certificate Holder currently anticipates that the Phase 1 EM&CP will be followed by a limited notice to proceed that authorizes all Phase 1 work to proceed immediately upon approval aside from installation of the: (1) Equipment (described below in Certificate Conditions 75 [d] and 81), which will not be allowed to proceed until the issuance of the: (i) Construction and Operations Plan (COP) approval by the Bureau of Ocean Energy Management, (ii) the Individual Permit issued by the USACE (the Corps Permit), and (iii) National Park Service special use permit.

18. The Certificate Holder shall not commence post-Phase 1 work prior to the issuance of the: (i) COP approval; (ii) the Corps Permit; (iii) appropriate Work Permit by the New York State Office of General Services; and (iv) remaining permits necessary to place the transmission cable (i.e., an appropriate EM&CP approval by the Commission and National Park Service special use permit). The Certificate Holders shall provide copies of said permits to the Secretary

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within 15 days of receipt. In no event shall a delay or failure to obtain any of the above-referenced approvals serve as an occasion or justification for a deferral or alteration of any and all required site clean-up and restoration activities as set forth in the applicable EM&CP and relevant sections of this Certificate.

19. To the extent required in connection with the delivery of oversized components, supplies, or equipment for the Project, the Certificate Holder or its suppliers shall obtain any required permits from applicable State or local agencies, including NYSDOT, subject to Condition 14 hereof and to the ongoing jurisdiction of the Commission. Oversized delivery of cable and other materials for the Project will occur in accordance with traffic controls specified in the EM&CP to minimize, to the extent practical, disruption of traffic and be coordinated with NYSDOT to the extent the delivery will occur on or impact a NYSDOT roadway. In addition, the Certificate Holder will provide New York State Department of Public Service (NYSDPS) and NYSDOT, and, as applicable, the Town, with at least one-week advanced notice of each oversized delivery that will require a road closure, in compliance with the Maintenance and Protection of Traffic (MPT) Plan.

20. To the extent a disagreement arises regarding the implementation of the Joint Proposal and any of its provisions that cannot be informally resolved by the Signatory Parties: (a) the Signatory Parties shall promptly convene a telephone conference, and in good faith attempt to resolve any such disagreement; and (b) if any such disagreement cannot be resolved by the Signatory Parties, any Signatory Party may petition the Commission for resolution of the disputed matter. The Certificate Holder shall use best efforts to select a mutually agreeable date for such a telephone conference, and shall file a notice with the Secretary or otherwise take reasonable steps to provide notice to the Signatory Parties that is timely under the circumstances.

C. **Public Health and Safety**

21. The Certificate Holder shall design, engineer, and construct the Project such that its operation shall comply with the electric and magnetic field (EMF) guidelines and standards established by the Commission in Opinion No. 78-13, issued June 19, 1978, and the Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities, issued September 11, 1990, or the Commission's most recent electric and magnetic field guidelines and standards in effect at the time the Commission grants the Certificate.

22. The Certificate Holder will conduct post-construction bathymetric measurements of the Sunrise Wind Export Cable (SRWEC)-NYS location and burial depth. Those measurements will, in turn, be analyzed with the SRWEC-NYS as-built installation plan and profile drawings and maps to report deviations that could potentially cause the cables to exceed stated ratings (i.e., to carry long-term currents greater than stated in the Appendix 4-J to the Application). Any such deviations shall be memorialized and summarized in a report that includes a detailed impact assessment, including an evaluation as to whether any deviations would pose a hazard to public safety, adverse impact to marine navigation, or is demonstrated to adversely impact marine species (the Post-Construction EMF Report). The Post-Construction EMF Report will be filed with the Secretary within 4 months of the availability of the aforementioned information.

23. In addition to the above post-construction review described in Condition 22, the Certificate Holder also will file with the Secretary a summary of the results of the first 6 months of monitoring of the current flow on the SRWEC–NYS (the current flow on the onshore underground cables will be similar) following the Commercial Operation Date (COD). That monitoring is stated to include logging of DC cable primary values (DC power flow) and will establish the relationship between EMF level and wind farm output. In addition, periodic measurements of AC frequencies up to 3 kilohertz (kHz) will be manually

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recorded monthly during this period by the transient fault recorder (part of the high voltage direct current (HVDC) control and protection system). Further, based upon the as-built configurations and recorded current flows the Certificate Holder will file with the Secretary an assessment of the static (DC) magnetic field produced by the SRWEC–NYS during the first 6 months of commercial operation at 1 m (3.3 ft) above the seabed and at horizontal distances of 10, 50, 150, and 200 ft (3, 15, 45, 60 m) and from representative locations (tabular and graphical representations of mG difference from above ambient levels of the geomagnetic field along transects oriented perpendicular to the cable center line). These representative locations will describe the range of burial depths and cable configurations measured in the bathymetric survey. They will further cover the range of current levels recorded during the first 6 months of monitoring. This EMF Verification Assessment will validate the Certificate Holder's model by comparing the calculated levels of magnetic fields and induced electric fields submitted in the Application to the levels of these fields determined from the as-built operational data gathered above. A general summary and evaluation of the magnitude and potential significance of any recorded AC currents will also be part of this assessment. The EMF Verification Assessment will be submitted before the end of the first year of the Project's COD.

24. In addition, the Certificate Holder will submit measurements of the DC magnetic field taken 1 m (3.3 ft) above ground over a short, onshore section of SRWEC–NYS and at horizontal distances of 10, 50, 150, and 200 ft (3, 15, 45, 60 m), if possible, from representative locations within this area. These onshore measurements will be performed in general accordance with applicable standards (e.g., IEEE Std. C95.3-2022) before and after energization of the cable to confirm that the magnitudes of the calculated DC magnetic fields at that location, based upon as-built specifications and recorded DC current flow, are an accurate predictor of the measured DC magnetic field consistent with the limits of the combined measurement accuracy and measurement variation. The measurements will be included in the EMF Verification Assessment. In addition, the Certificate Holder will take measurements with a magnetometer to capture the DC magnetic field taken above representative offshore segments of the SRWEC–NYS and included in the EMF Verification Assessment (Condition 23). Measurements will include the total magnetic field (earth + cable) at horizontal distances of 10, 50, 150, and 200 ft (3, 15, 45, 60 m) from representative segments (if accessible). Based upon the as-built drawings (as described in Condition 23), representative segments will include configurations of the SRWEC–NYS at varying burial depths and cable configurations (side-by-side and top-over-bottom) and a mattress-covered segment (if any). If as-built drawings (as described in Condition 23) show that one configuration is not present for a sufficient extent (e.g., at least 100 m or 328 ft), two measurements over the dominant configuration will be performed.

25. As detailed in Conditions 140, 141, 142, and 146, the Certificate Holder has prepared a Fisheries Monitoring Plan (Appendix N) and Benthic Sampling Plan (Appendix O) that will, in part, assess the potential impacts associated with the operation of the SRWEC–NYS on the behaviors and migratory patterns of commercially and ecologically important species in coastal waters south of Long Island. Because the as-built configurations and recording of operational current levels on the SRWEC–NYS will allow accurate evaluation of magnetic and induced electric field levels at any time, location, and distance from the installed SRWEC–NYS, the Certificate Holder will provide the EMF levels obtained for specific locations, days, and time of operation in conjunction with the above-referenced study to the researchers conducting the monitoring under the Fisheries Monitoring Plan and Benthic Sampling Plan.

26. If environmental or engineering constraints require siting of the onshore transmission cable within 100 ft (30 m) of a known existing, active drinking water supply well, the Certificate Holder shall perform pre- and post-construction water turbidity testing, provided the Certificate Holder is granted access by the property owner. The results of such tests and reports shall be made available to the parties upon request.

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a. Should New York State Department of Health (NYSDOH)-certified laboratory testing conclude that the water turbidity from an existing, active drinking water supply well was less than the New York State standard of 5 nephelometric turbidity units for drinking water prior to construction, but failed to meet such standards post-construction, the Certificate Holder shall cause a new water well to be constructed, in consultation with the property owner, at least 100 ft (30 m) from the onshore transmission cable, as practicable given siting constraints and landowner preferences. Such protocols will be included as part of any applicable EM&CP.

27. The Certificate Holder shall engineer and construct the Project to be fully compatible with the operation and maintenance of any nearby electric, gas, telecommunication, water, sewer, and related facilities. Site plans and profiles of the EM&CP shall include existing underground utility or non-utility structures including but not limited to gas, water, telecommunication or electric cable or pipeline, to the extent known, and will identify the relationship of the facility to adjacent fence lines; roads; railways; airfields; property lines; hedgerows; fresh surface waters; wetlands; other water bodies; significant habitats; associated facilities; water springs; adjacent buildings; water wells; or structures; major antennas; oil or gas wells, pipeline facilities, and compressor and pressure-limiting and regulating stations. If required by existing utility owner/operator impacted by facility installation, copies of the following information shall be provided in the EM&CP, prior to commencement of the activity (including but not limited to proposed facility crossings, co-locations, construction within existing easement, and machinery crossings) related to that utility's requirement:

a. Results of any cathodic protection impact studies;

b. Executed agreement, if any, with existing utility (including a statement that facility installations meet existing utility owner technical and safety requirements and copies of all relevant technical and safety manuals);

c. Details of existing utility owner approved crossing plans (crossed by Project components) showing methods, separation of existing utility and Project components, cover, installation of protection measures, and workspace, including any bore pits or similar features;

d. Details of existing utility owner approved co-location installations (with Project components) showing separation distances of existing utilities and Project components and any required or protection measures; and

e. Details and descriptions of existing utility owner approved methods regarding Project construction equipment crossing of existing utilities approved by each existing utility owner.

28. The Certificate Holder shall keep local fire department and emergency management services apprised of the presence of on-site hazardous chemicals and waste. Procedures for the handling of any hazardous chemicals and waste are detailed in Section U below.

29. The Certificate Holder shall comply with the requirements for the protection of underground facilities set forth in 16 *NYCRR* Part 753 "Protection of Underground Facilities." The Certificate Holder shall require all contractors, excavators, and operators associated with its facilities to comply with all requirements of the Commission's regulations regarding identification and numbering of above ground utility poles (16 *NYCRR* Part 217). The Certificate Holder shall be responsible for contractually enforcing such compliance.

30. The Certificate Holder shall have the right to require that any person seeking to access the Project first be appropriately trained in environmental protection and worksite safety. The Certificate Holder will provide site inspectors and scheduled visitors with appropriate personal protective equipment for any tours of the Project. This may include a properly fitted, currently valid hardhat, safety glasses with side shields, high visibility vest, and steel or ceramic-

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toed boots at any time while on site, unless the visitor is in a vehicle or in a construction trailer. The Certificate Holder may require site inspectors and scheduled visitors to comply with all safety and security requirements.

31. The Certificate Holder shall require its contractors or subcontractors to give an on-site tailboard safety briefing to site inspectors/visitors prior to any safety inspectors/visitors entering the Project site.

32. The Certificate Holder will provide periodic, or as needed, training sessions for the Town's Fire Department, and any other interested fire departments within Suffolk County (the County), to review the procedures and protocols necessary to safely respond to emergency events at the OnCS–DC and the Holbrook Substation. The Certificate Holder shall coordinate with PSEG Long Island (PSEG-LI) to ensure that such training includes procedures and protocols for emergency events at the existing facilities adjacent to the interconnection facility.

33. After final designs are submitted and buildings are identified for construction of the OnCS–DC, the Uniform Fire Prevention and Building Code will apply and the Certificate Holder shall obtain review and written certification by a public entity recognized by the New York State Department of State (NYSDOS) as having the requisite training or qualifications that the construction plans are in compliance with the Uniform Fire Prevention and Building Code.

34. The Certificate Holder shall use best efforts to avoid any thermal or capacity derating of any existing or proposed Long Island Power Authority (LIPA) transmission and distribution cables along the entire route of the Project.

35. Any stop work order made in accordance with these Certificate Conditions will be complied with following completion of safety procedures and emergency protocols, unless operations must be continued to protect life, property, or the structural integrity of the ongoing construction.

D. **Environmental Management and Construction Plan Process**

36. The Certificate Holder shall follow the process and procedures described herein for each Phase of the EM&CP.

37. The Certificate Holder shall file a copy of the EM&CP with the Secretary for approval by the Commission. Contemporaneously with the submission and service of the EM&CP, Certificate Holder shall provide notice, in the manner specified below, that the EM&CP has been filed (the EM&CP Filing Notice). In addition, the Certificate Holder shall provide copies of the EM&CP as follows:

a. three hard copies and one electronic copy to the Secretary;

b. one electronic copy to: (i) the Commissioner of the New York State Office of Parks, Recreation and Historic Preservation (OPRHP); (ii) the Commissioner of the NYSDOT; (iii) the General Counsel of LIPA; (iv) the Secretary of State of the State of New York (NYSDOS); (v) the Commissioner of the New York State Department of Agriculture and Markets (NYSAGM), and (vi) the Commissioner of the New York State Department of Environmental Conservation (NYSDEC);

c. one electronic and one hard copy to the NYSDEC's Central Office in Albany;

d. one electronic copy to any other New York State agency (and its relevant regional offices) that requests the document;

e. one electronic copy to all parties on the service list for Case 20-T-0617; and

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f. one hard copy for inspection by the public in at least one public library or other convenient location in each municipality in which construction will take place.

38. The Certificate Holder shall serve a copy of the EM&CP Filing Notice on all parties to the Proceeding and on the owners of property crossed by or abutting the impacted portion of the Project Corridor. Further, the Certificate Holder shall contemporaneously publish the EM&CP Filing Notice in a newspaper of general circulation in the vicinity of the Project and a free publication (if available) in the relevant vicinity of the Project.

39. The written EM&CP Filing Notice and the newspaper notice(s) shall contain, at a minimum, the following:

a. a statement that the EM&CP has been or will soon be filed;

b. a general description of the Project, the need for the Project, and of the proposed EM&CP;

c. a listing of the locations and website where the proposed EM&CP is available for public inspection;

d. a statement that any person desiring additional information about a specific geographical location or specific subject may request such information from the Certificate Holder;

e. the name, address, email, and toll-free telephone number of the Certificate Holder's representative;

f. the email and postal address of the Secretary and the URL for the NYSDPS's Document Management and Matter System; and

g. a statement that any person may be heard by the Commission on any matter or objection regarding the proposed EM&CP by filing written comments with the Secretary within 45 days of the EM&CP filing date or within 45 days of the date of the newspaper notice, whichever is later. Comments on subsequent revisions to the EM&CP, in response to the aforementioned written comments, shall be permitted within 15 days of service by electronic means of said revisions.

40. The Certificate Holder shall submit to the Secretary a certificate of service with supporting affidavits indicating upon whom all EM&CP documents and EM&CP Filing Notice was served within 3 business days after the proposed EM&CP is filed. This submission shall be a condition precedent to approval of the EM&CP. When available, the Certificate Holder shall file with the Secretary proof of newspaper publication of a copy of the EM&CP Filing Notice.

41. The Certificate Holder shall follow the following procedures for any proposed change or modification to the EM&CP that has been approved by the Commission:

a. The Certificate Holder shall report any proposed changes to the EM&CP to NYSDPS. Any requested change or modification to the approved EM&CP that will not result in an increase in adverse environmental impacts or are not directly related to contested issues decided by the Administrative Law Judges or the Commission during the proceeding (minor change) will be decided, in writing, by the Chief and/or Director of Environmental Certification and Compliance Section (EC&C) of the Office of Electric, Gas and Water, or his or her designee. That decision will be filed with the Secretary's office. NYSDPS will refer all other proposed changes (major change) to the Commission for approval.

b. Upon being advised that NYSDPS will refer a proposed change to the Commission, the Certificate Holder shall provide electronic notice of the proposed change to all parties to the proceeding, as well as owners of all property owners that abut the right-of-way, work areas, and all properties on which property rights are required. The notice shall: (1) describe the original conditions and the requested change; (2) state that documents supporting

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the request are available for inspection at specified locations; and (3) state that persons may comment by writing or calling (followed by written confirmation) to the Commission within 21 days of the notification date.

c. The Certificate Holder shall not execute any proposed change until the Certificate Holder has received the appropriate oral or written approval, except in emergency situations threatening personal injury, property, or severe adverse environmental impact. Any oral approval from NYSDPS will be followed by written approval from the Director of EC&C, their designee, or the Commission.

42. The Certificate Holder, where necessary, shall negotiate for additional temporary easements for construction purposes as identified in the EM&CP and approved by the Commission. Any temporary easement or construction areas not identified in the approved EM&CP may be requested through changes thereto in accordance with the process outlined in Condition 41.

E. **Environmental Management and Construction Plan Contents**

43. The Certificate Holder shall not commence site preparation or construction for any portion of the Project before it has submitted to the Commission and the Commission has approved the relevant phase of the EM&CP. Any phase of the EM&CP shall be organized and developed in a manner that is generally consistent with the Certificate and the Specifications for Development of EM&CP attached as Appendix E to the Joint Proposal. The Certificate Conditions and Appendix E shall be read together to describe the EM&CP's required contents. In addition, the Certificate Holder shall include the following details in the appropriate EM&CP:

a. The delineation of Project Corridor, as identified in Appendix B, and any temporary laydown yards and work areas to which Certificate Holder shall confine construction and subsequent maintenance activities, depicting property rights, clearing rights, access rights, and such other matters as appropriate to address the site and environmental conditions and property interests of affected landowners, and relevant conditions and requirements of the EM&CP. The delineation shall include the specific location and acreage of all needed real property or real property rights.

b. Details of street work, including provisions for minimizing the duration and extent of open excavation, traffic disruptions, and work within and adjoining public streets and ROW.

c. Drawings delineating the locations for existing and proposed access roads. Proposed access road improvements shall be indicated, including measures for environmental impact minimization and access control.

d. An MPT Plan for all roadways directly affected by construction activities prepared in conformance with the National Manual on Uniform Traffic Control Devices (MUTCD) and New York State Supplement. The Certificate Holder shall consult with traversed school districts prior to the Commencement of Construction and the MPT Plan will reflect the outcomes of those consultations, including any measures taken with respect to school bus routes.

e. The information necessary to respond to the requirements of 17 *NYCRR* Part 131, entitled Accommodation of Utilities Within State Highway Right-of-Way, applicable design standards of the American Association of State Highway and Transportation Officials ("AASHTO"), the Highway Design Manual, the Policy and Standards for Entrances to State Highways, the Requirements for the Design and Construction of Underground Utility Installations within the State Highway ROW and the Accommodation Plan, including the provision of NYSDOT Standard Details and Standard Item Numbers.

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f. The Certificate Holder shall include consultation results between itself, the NYSDOT, and the Suffolk County Department of Public Works (DPW) regarding construction work near the existing William Floyd Bridge in the post-Phase 1 EM&CP. This report shall identify the responsible party and include details of any required site restoration, mitigation measures and/or restrictions, if any, associated with this work.

g. A plan for access to construct the Project in the NYSDOT-owned highway ROW clearly defining all access locations and rights and a plan for access to the Project on the NYSDOT-owned highway ROW for operation and maintenance including an MPT Plan in conformance with MUTCD and New York State Supplement.

h. A plan for access to construct the Project in parkland and open space areas and associated municipally owned parking areas clearly defining all access locations and rights and a plan for future access to the Project. The EM&CP should demonstrate that access to the Project will not hinder use of recreational areas nor reduce existing parking areas below what is needed to accommodate seasonal use.

i. A Material Management Plan that will outline the process and procedures for the handling of any contaminants or hazardous waste encountered during construction.

i. For any excavated material not used as backfill, the final material disposal location must be submitted to NYSDPS, the Town, and NYSDEC at least 30 days prior to disposal. Disposal of all material must comply with 6 *NYCRR* Part 360 et seq.

ii. If contamination in the ground is detected during construction of the facility, and such contamination is of the kind that will lead to volatilization or off-gassing of such contamination or chemical constituents thereof, the Certificate Holder shall contact NYSDOH, NYSDEC, and NYSDPS prior to further disturbance. Additionally, the Certificate Holder shall conform to practices and procedures described in the DER-10/Technical Guidance for Site Investigation and Remediation and the NYSDOH Generic Community Air Monitoring Plan ("CAMP"), to the extent applicable.

j. Locations, dimensions, and installation methods to be used for the installation of the Project's concrete and/or direct buried splice vaults.

44. During the preparation of the EM&CP and again prior to Commencement of Construction, if the Commencement of Construction is more than 1 year after receipt of the updates obtained to draft the EM&CP, the Certificate Holder shall contact NYSDEC, NYS Natural Heritage Program, NYSDOS, and United States Fish and Wildlife Service (USFWS) and review publicly available information from National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) to check for any updates or changes of known threatened or endangered (T&E) species or habitat, NYS Significant Coastal Fish and Wildlife Habitats, and Significant Natural Communities in the Project Corridor. Resulting notifications will be handled in accordance with Condition 75 (e).

45. Prior to the approval of any applicable EM&CP, the Certificate Holder shall file with the Secretary upon receipt: the Stormwater Pollution Prevention Plan (SWPPP), Municipal Separate Storm Sewer (MS4) approval(s), 5-acre waiver (if necessary), and NYSDEC's letter of acknowledgement of the Notice of Intent for coverage under the State Pollutant Discharge Elimination System (SPDES) *General Permit for Stormwater Discharges from Construction Activity* (the SPDES General Permit). The Certificate Holder shall develop the EM&CP in accordance with the SWPPP requirements in the SPDES General Permit in effect at the time of the filing of the EM&CP. Notwithstanding the foregoing, if any necessary MS4 approval has not been obtained by the Certificate Holder prior to the EM&CP being filed with the Secretary, the Certificate Holder shall file a draft SWPPP at the time it files the EM&CP with the Secretary. If any of the aforementioned documents require modification of the EM&CP, such modifications shall be filed with the Secretary prior to EM&CP approval.

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46. The Certificate Holder shall include a Lighting Plan as part of the Phase 1 EM&CP, which shall include the following guidelines for lighting to be used on the Project: a. Security lighting needs at the OnCS–DC and any exterior equipment storage yards. b. Plan and profile figures to demonstrate the lighting area needs and proposed lighting arrangement at the OnCS–DC and any exterior equipment storage yards. c. A specification that lighting should be designed to provide safe working conditions at appropriate locations. d. A specification that exterior lighting design shall be specified to minimize, to the extent possible, off-site lighting effects, by: i. using task lighting only as needed and as appropriate to perform specific installation, maintenance, repair, or emergency-response tasks; task lighting shall be designed to be capable of manual or auto-shut off switch activation rather than motion detection; and ii. requiring full cutoff fixtures, with no drop-down optical elements (that can spread illumination and create glare) for permanent exterior security lighting. e. manufacturer's cut sheets of all proposed lighting fixtures shall be provided. 47. The Certificate Holder shall file as part of the EM&CP concerning construction of the OnCS–DC, details of proposed noise control features and design requirements of the OnCS– DC site (OnCS–DC Site) to achieve design goals, including prominent tone effects, at noise-sensitive receptor locations, and the following: a. Final drawings for the OnCS–DC Site, incorporating any changes to the design, including: i. location of all noise sources and receptors identified with Geographic Information Systems (GIS) coordinates in tabular format and GIS digital files; ii. proposed grading and noise source heights and ground elevations; Site plan and elevation details of the OnCS–DC Site components as related to the location of all relevant noise sources (e.g. transformers, reactors, filters, HVAC and HVDC equipment, and emergency generators, if any); iii. identified mitigations, specifications, and appropriate clearances (e.g., sound walls, barriers, enclosures, converter hall building walls, low-noise fans); and iv. sound information from the manufacturers for all noise sources (e.g. transformers, reactors, HVAC and HVDC equipment, emergency generators, if any). b. Revised sound modeling with the final specifications of equipment selected for construction to demonstrate that the OnCS–DC Site is modeled to meet the sound goals and limits for residences, commercial and industrial properties existing as of the date the Order is issued as noted in Certificate Condition 49. 48. Noise levels from all noise sources within the OnCS–DC Site at any operational conditions shall: a. Comply with a noise limit of 42 dBA Leq (1-hour) maximum equivalent continuous average sound level at the outside of any non-participating residence. Emergencies are exempt.

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b. Should a prominent tone be expected to occur (from the final design before construction), or occur (during operation, after construction), at any non-participating residential position, the broadband overall (dBA) noise level at the evaluated position shall be increased by 5 dBA for evaluation of compliance with the maximum noise limit indicate in Certificate Condition 48 (i).

c. 45 dBA Leq-1-hour maximum equivalent sound level from the OnCS–DC Site across any portion of non-participating residential properties, except for delineated wetlands and utility rights of way. This shall be demonstrated with modeled sound contours and discrete sound levels at worst-case locations. No penalties for prominent tones will be added in the evaluation of this limit.

d. The Leq-1-hour maximum A-weighted ambient sound level from the OnCS–DC Site, will not exceed the maximum permissible sound pressure levels as specified by the Town's Code, Chapter 50, for industrial and commercial properties. This shall be demonstrated with modeled sound contours and discrete sound levels at worst-case locations. No penalties for prominent tones will be added in the evaluation of this limit.

e. Final pre-construction computer noise modeling and tonality evaluation shall be conducted in accordance with the Specifications for Computer Noise Modeling and Tonal Evaluation, Appendix L.

49. To evaluate compliance with noise-related conditions after construction, during operation, the Certificate Holder shall comply with the following requirements:

a. The OnCS–DC Site shall be evaluated by the Certificate Holder by following the provisions and procedures for post-construction noise performance evaluations included in the Sound Testing Compliance Protocol, Appendix M, after the COD of the OnCS–DC Site.

b. Within 7 months after the COD of the OnCS–DC Site, the Certificate Holder shall perform and complete at least one sound compliance test and the results shall be submitted by filing with the Commission a report from an independent acoustical or noise consultant, no later than 8 months after the COD, specifying whether or not the OnCS–DC Site is found in compliance with all Certificate Conditions regarding noise.

50. If the results of the post-construction sound compliance test, or any subsequent test, or any compliance or violation test, indicate that the OnCS–DC Site does not comply with Certificate Conditions on noise, the Certificate Holder shall:

a. Present noise minimization options to the Commission (e.g. sound barriers, enclosures, replacement or maintenance of noisy components, silencers, low-noise fans, any other mitigation measures as feasible and appropriate), within 60 days after the filing of a non-compliance test result or the finding of a non-compliance or a violation of permit conditions on noise.

b. Upon approval from the Commission, implement any noise minimization measures within 150 days after the finding of a non-compliance or violation, as necessary to achieve compliance.

c. Operate the OnCS–DC Site with the minimization measures presented and approved by the Commission.

d. Test, document, and present results to the Commission of any minimization measures implemented showing compliance with all conditions on noise, no later than 90 days after the minimization measures are implemented.

51. The EM&CP shall identify any water withdrawal activities that the Certificate Holder anticipates will be regulated pursuant to 6 *NYCRR* §§ 601.3 and 601.6, including dewatering directly from the excavation not meeting the exemption criteria pursuant to 6 *NYCRR* §§ 601.9 (o). The EM&CP shall also

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provide the information outlined in 6 *NYCRR* § 601.10 for any such activities. Prior to commencement of such activities, NYSDPS, in consultation with NYSDEC, will determine whether to recommend that the Commission impose any conditions or restrictions on such activities. Such determination will be based on the substantive portions of the following regulations: 6 *NYCRR* §§ 601.11, 601.12, 601.16, 601.19, and 601.20.

52. The EM&CP shall identify the property locations, if any, where the Certificate Holder anticipates that it will install one or more wells to conduct temporary or permanent dewatering activity for the Project at a total withdrawal capacity of such well or wells on any one property in excess of 45 gallons per minute (with capacity based on the capacity of the pumps to be installed, not on the contemplated draft). The EM&CP shall also provide the substantive information outlined in 6 *NYCRR* 602.3 (c)-(d) for any such activities. Prior to commencement of such activities, NYSDPS, in consultation with NYSDEC, will determine whether to recommend that the Commission impose any conditions or restrictions on such activities. Such determination will be based on the standards of issuance in Environmental Conservation Law (ECL) 15-1527 (4).

53. Certificate Holder shall provide a Dewatering Plan at least 45 days prior to filing each applicable EM&CP to NYSDPS, NYSDOS, NYSDOT, and NYSDEC for review and comment. The Dewatering Plan shall be filed with the EM&CP and include:

a. locations where dewatering will be required, including the anticipated depth of groundwater and the installation depth of the cable and vaults at those locations;

b. method of dewatering, including the number and depth of the well points (if applicable);

c. pump capacity, rate, and estimated daily pumpage and duration of dewatering for each location requiring dewatering, or, if not available at the time of the circulation of the Dewatering Plan, typical specifications that will be followed during final selection of equipment unless otherwise agreed upon by NYSDPS and NYSDEC;

d. if uncontaminated water from dewatering operations will be discharged to groundwater or surface water, the Dewatering Plan shall include the following:

i. a map showing proposed discharge location points;

ii. if discharging to a storm drain or recharge basin, verification that these systems are designed to handle the proposed rate for the duration of the discharge and the substantive requirements for all state, county, and town approvals are being met for such discharges;

iii. if discharging to a storm drain, identify the ultimate surface water outfall location;

iv. if discharging to an existing recharge basin or creating a new recharge basin, evaluation of mounding effects to ensure that mounding does not adversely affect any surrounding properties and underground structures; and

v. best management practices to prevent erosion and sedimentation from dewatering operations.

e. maps of areas requiring dewatering with wells (if applicable);

f. maps of areas requiring dewatering within or adjacent to the NY Central Pine Barrens and within or adjacent to the Carmans River 100-year Groundwater Contributing Area;

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g. verification that dewatering operations conducted using wells are carried out by a well driller duly registered in accordance with ECL § 15-1525;

h. effluent limits provided by NYSDEC based on applicable regulations, standards, criteria, and guidance values;

i. treatment and disposal plan for contaminated water generated from the dewatering operations;

j. sampling plan that will be followed during dewatering operations of influent and effluent; and

k. sampling plan that will be followed in the event dewatering is required in locations that were not anticipated.

l. NYSDOT shall have the right to terminate or restrict discharge flow conveyed into the NYSDOT drainage system during and after storm events to prevent overburdening of the NYSDOT drainage system.

54. The Certificate Holder shall submit the following information to NYSDOT for review and approval prior to any proposed discharge into the NYSDOT drainage system:

a. method of conveyance;

b. discharge flow rate;

c. duration of discharge; and

d. water sampling.

55. The Certificate Holder shall prepare a detailed Onshore Soil Handling and Erosion Control Plan to be included in any applicable EM&CP. The Onshore Soil Handling and Erosion Control Plan shall include specifications for testing, stockpiling, reuse or removal from site, storage, erosion control, restoration, and compaction of backfill in trenches. Such plan shall be consistent with the acknowledged SPDES General Permit and SWPPP.

56. The applicable EM&CP shall address and/or include, but not be limited to, the following information:

a. a construction schedule detailing work activities and allowable work windows, which shall be provided to NYSDPS, NYSAGM, NYSDEC, NYSDOT, NYSDOS, and the Town at least 45 days prior to filing the EM&CP for review and comment;

b. a Horizontal Directional Drill (HDD) work plan providing planning, feasibility analysis, installation controls, and site measures (including excavation and backfill of the HDD exit) that will be taken in accordance with good engineering practices that will be consistent with Appendix H of the Joint Proposal, HDD Work Plan Scope of Study;

c. the locations of any HDD entry and exit shall be detailed in the EM&CP;

d. cable burial techniques and adjustments along the SRWEC–NYS, including a detailed graphical representation of anticipated minimum and maximum achievable burial depths based on sediment conditions (e.g., sediment densities, shear strengths, and other limiting factors) at 100-foot intervals; written evaluation of the likelihood of achieving target burial depths based on the results of the study; and a quantitative analysis of risks to the cable and coastal users along the SRWEC–NYS. The Certificate Holder shall provide this information to NYSDPS, NYSDEC, NYSDOS, and Long Island Commercial Fishing Association (LICFA) at least 30 days prior to filing the EM&CP for review and comment;

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e. written evaluation of the efficacy of alternative cable protection measures that may be required along the SRWEC–NYS and justification for why the selected cable protection method is preferred at each site. The analysis shall: (i) include, to the extent available, technical documentation from cable protection manufacturers; and (ii) evaluate a range of cable protection measures (e.g., concrete mattresses with taper edges, self-burying, crushed rock, and rock bags or other appropriate protection method(s)) with respect to their ability to maintain overtrawlability, minimize shifting over time, and avoid creating a discernable berm on the seafloor.

f. a work plan for dredging activities, including specific practices to be used during dredging; specifications of any dredging equipment; and purpose; any temporary protection and/or additional excavation that may be needed if HDD activities occur across multiple work windows; and proof of the ability to provide proper disposal of excavated material not used as natural backfill, which shall be provided to NYSDPS, NYSAGM, NYSDEC, and NYSDOS at least 45 days prior to filing the EM&CP for review and comment;

g. a Suspended Sediment and Water Quality Monitoring Plan, which shall be provided to NYSDPS, NYSDEC, and NYSDOS, at least 45 days prior to filing the EM&CP for review and comment and will be consistent with Appendix I of the Joint Proposal, Suspended Sediment and Water Quality Plan Scope of Study, for cable burial activities;

h. details of cable pulling and splicing plans including details associated with installation of spare conduits along the onshore transmission cable route. The splicing plan shall be provided to NYSDPS, NYSDEC, and NYSDOS at least 45 days prior to filing the EM&CP for review and comment; and

i. details on the area and duration of any temporary in-water closures needed during HDD and cable laying activities; how these areas have been minimized; details on how mariners, including commercial, recreational, and for-hire (charter) fishermen and other recreational boaters, will be alerted to the presence of the in-water work area, including any Private Aids to Navigation (PATON) that may be required in State waters; and identification of activities that will be the subject of United States Coast Guard's (USCG) Local Notice to Mariners.

57. A detailed Highway Work Plan governing activities within highway ROW, prepared in coordination with the Town Highway Department, NYSDOT, and NYSDPS, and in compliance with 17 *NYCRR* Part 131, shall be included in each applicable EM&CP, and shall cover at a minimum:

a. a schedule showing the sequence and duration of trenching, backfilling, drilling and/or pipejacking, cable delivery (per Condition 110) and pulling, splicing, and testing;

b. a traffic diversion/lane closure plan, as described in Condition 43 (d), which shall identify procedures to be used to maintain traffic and provide a safe construction zone for those activities within the roadway ROW. The plan shall also describe temporary signage, lane closures, placement of temporary barriers and traffic diversion. Flaggers shall always be present when equipment is crossing any road when equipment is being loaded or unloaded, and where two-lane traffic has been reduced to one lane;

c. coordination with planned highway and bridge construction and repair projects, as described in Condition 43 (f), and repair projects;

d. a map showing the location of: the trench with reference to the paved highway surface, lay down and mobilization areas, drilling and HDD exit, pipejacking entry and exit, and splicing locations;

e. trench profile;

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f. a plan for trench backfilling, marking and protection, and temporary covering;

g. a plan for trenching and cable laying in the vicinity of other underground utility lines, conduits and pipes;

h. a Soil Handling and Erosion Control Plan, including a plan for the handling of any contaminated materials (as described in Condition 55);

i. a Vegetation Management Plan, that includes, a post-completion assessment of the need for remedial vegetation plantings (as described in Section V);

j. a plan for minimizing construction-related noise during the hours between 7:00 p.m. and 7:00 a.m., pursuant to Conditions 76 and 77;

k. a plan for minimizing construction-related lighting impacts on surrounding areas (as described in Condition 46); and

l. a plan for minimizing disruption of traffic, pedestrian and recreational use (as described in Condition 58).

58. Unless otherwise approved by the NYSDOT, Certificate Holder agrees to abide by the following traffic restrictions in NYSDOT-owned highway ROW, which will be incorporated into each applicable EM&CP:

a. No lane closures will be permitted on the South Service Road if there is a closure on the impacted portion of the eastbound side of the Long Island Expressway. Traffic shall be shifted as necessary to maintain at least one (1) 12-foot lane in each direction.

b. Unless otherwise permitted by the NYSDOT issued Highway Work Permit, no lane shifts will be allowed on weekends and on the following days:

i. from noon on the Friday before Memorial Day through Labor Day;

ii. Veterans Day;

iii. from noon the day before Thanksgiving Day through the Sunday following Thanksgiving Day;

iv. the day before Christmas and Christmas Day; and

v. the day before New Year's and New Year's Day.

c. At all other locations, lane shifts will be permitted between 10:00 AM and 3:00 PM.

d. Prior to nighttime operations and whenever there is on-street parking within the work zone, the Certificate Holder shall post signs spaced every 200 ft (60 m) through the work zone that state: "No parking 10:00 p.m. to 6:00 a.m." The Certificate Holder shall also distribute flyers to all businesses and residents along the work zone at least 72 hours before the implementation of the parking restrictions. Existing parking signs within the work zone, which are conflicting with the nighttime construction parking restrictions, shall be covered completely with an opaque material, as ordered by the engineer (AOBE).

e. The Certificate Holder shall not work on both sides of the roadway in the same area at the same time.

f. The Certificate Holder shall notify the Town engineer, the Suffolk County Highway Department, the Suffolk County Police Department, the Town of Brookhaven Police Department, NYSDPS, and the NYSDOT Inform Center at least 7 calendar days prior to all detours, proposed street closings, or any other work that might affect the mobility or access of emergency vehicles. In addition, the Certificate Holder shall ensure that hydrants and alarm boxes are kept clear and available.

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g. The Certificate Holder shall schedule its operations to minimize the interruption of pedestrian traffic. The sidewalk on one side of the roadway shall remain open and passable when practicable. During the reconstruction of sidewalks, pedestrian safety and property access must always be maintained to the satisfaction of the engineer. The Certificate Holder shall place all underground appurtenances under the sidewalk first.

59. The Certificate Holder shall use best efforts to coordinate its construction schedule with the Brookhaven Public School District to ensure that such construction operations will not interfere with the district's start and dismissal times and bussing schedules.

60. The Certificate Holder must submit a Fisheries Compensation Plan as part of the post-Phase 1 EM&CP.

a. The Fisheries Compensation Plan shall include:

i. A narrative overview of the claim process, including summary of the initial decision making process;

1. That narrative will include more details on the Fishing Conflict Prevention/Hazard Notification Claim Procedure, which covers claims for:

A. commercial fisheries gear losses during all phases of the Project, including fisheries and benthic monitoring efforts, scientific study, survey, construction, operation, maintenance, and/or decommissioning for the life of the Project (up to 100% value of gear); and

B. a reimbursement process for any temporary displacement, or temporary impairment to fishing following gear loss, of commercial fishing directly resulting from the Project's fisheries and benthic monitoring efforts, scientific study, survey, construction and maintenance activities, including any necessary cable reburial activities, and decommissioning activities (up to 50% of lost gross revenue).

2. As will be detailed further in the Fisheries Compensation Plan: (1) a claimant may take advantage of both types of claims for a single event, and (2) in the event a claim is denied initially, the claimant will be informed why.

3. The Fisheries Compensation Plan will not preclude the Certificate Holder from delegating the claims process to a third-party administrator.

A. A narrative overview of the process for claimants to appeal any decision regarding their claims to an independent third-party arbitrator, including the ability of a claimant who is successful on appeal to seek reimbursement for any lost revenue associated with the appeal process; and

4. Certificate Holder will inform any claimant when a third-party arbitrator has been assigned to their appeal. The third party arbiter will be unbiased (i.e. individuals not employed by the Certificate Holder). He or she will be a practicing or retired attorney, current or former judge, arbitrator and/or mediator. In all cases, the third party arbiter will have knowledge of the offshore environment and general knowledge of various offshore activities including but not limited to fishing, shipping, surveying and offshore construction. Appeals will be provided to the third-party arbiter with the Notice of Appeal and the claimant's complete claim. No new information will be considered on appeal.

A. A statement that the number of claims submitted by persons or entities pursuant to sections (a) (i) (1) and (2) of this section and adjudicated by the Certificate Holder shall not be limited.

b. The Certificate Holder shall file with the Secretary a summary of all claims filed, on a quarterly basis following issuance of the Certificate, including the claim type and the impacted fishing activity;

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c. The Certificate Holder must notify NYSDPS, NYSAGM, NYSDEC, and NYSDOS via electronic mail within 30 days of any resolution (i.e., denial or awarded) of a fisheries compensation claim. The notification must include a copy of the claim, the claim type, species impacted, and the fishing activity disrupted and/or displaced, and the resolution; and

d. The Certificate Holder shall not require any fisherman settling a fisheries compensation claim to sign a Non-Disclosure Agreement nor require waiver of any claims beyond the loss event initially claimed.

e. Following resolution of a successful claim under Condition 60 (a) that involves a repeatable incident, Certificate Holder will circulate appropriate internal messaging, including, as appropriate, to its contractors, to reduce likelihood of such recurrence.

F. **Notices and Public Comments**

61. The Certificate Holder shall comply with the mariner notification and input processes as provided for in Appendix J.

62. The Certificate Holder will facilitate the submission of comments through the use of a dedicated contact person. The Certificate Holder shall make available to the public a toll-free telephone number, for the duration of construction of the Project, for the purpose of answering questions and receiving complaints and feedback about the construction of the Project. All inquiries or complaints shall receive a response with an acknowledgement of receipt to the complainant within one business day. The toll-free telephone number shall include a recorded outgoing message that will, when a call is not answered by a person, provide the caller with the name of the Certificate Holder's representative as well as: (i) the number to be called at any time in case of emergency; (ii) when the caller can expect a return call, (iii) the telephone number and email address of the Secretary; and (iv) the telephone number of the NYSDPS EC&C Section.

63. The Certificate Holder's Project website shall provide a means for the public to communicate to the Certificate Holder about the Project (e.g., to register comments or ask questions) through either a direct link to a comment form or email or by providing a toll-free telephone number that will allow a representative of the Certificate Holder to respond to communications that include questions and concerns about the Project from members of the public. Certificate Holder shall post construction notices and other publicly relevant information to the Project website. The Project website shall allow users to subscribe (or unsubscribe) to receive Project updates. When subscribing to such notifications, subscribers will be able to choose whether to receive updates via electronic or regular mail to a specified address.

64. The Certificate Holder shall create a Complaint Management and Resolution Plan to be included as part of the Phase 1 EM&CP. The Complaint Management and Resolution Plan shall:

a. Require the Certificate Holder to retain, for 5 years following completion of construction, and for a rolling 5 years following commercial operation of, electronic copies of: (i) the telephone logs for any calls made to the Project's toll-free number; and (ii) any submission to the Project website. Such records shall be provided to NYSDEC and made available to NYSDPS and NYSDOS upon request.

b. Require the Certificate Holder to report to NYSDPS and NYSDEC every complaint that cannot be resolved, and describe the actions taken to address the complaint, within 10 business days after receipt of the complaint. Where the complainant provides contact information, require Certificate Holder to inform the complainant of actions Certificate Holder is taking to address the complaint.

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c. Require the Certificate Holder to maintain a toll-free telephone number during the Project's commercial operation to receive complaints.

65. The Certificate Holder shall comply with the following Notice of Intent to Commence Work (Construction NOI) requirements:

a. No less than 14 days before the Commencement of Construction, the Certificate Holder shall:

i. provide the Construction NOI to the NYSDEC Bureau of Energy Project Management, Division of Environmental Permits, 625 Broadway, Albany, NY 12233-1750 and NYSDOT Region 10 Traffic Engineer, 250 Veterans Memorial Highway, Room 6A6, Hauppauge, NY 11788;

ii. provide the Construction NOI to local officials, including the Town of Brookhaven and Suffolk County Clerk, the Suffolk County DPW, and emergency personnel, including local police and fire departments;

iii. provide the Construction NOI to LIPA and/or PSEG-LI, and any other affected utilities;

iv. provide the Construction NOI for dissemination to local media; and display in the Town Hall and public places, including but not limited to general stores, post offices, community centers, and conspicuous community bulletin boards;

v. provide the Construction NOI to the NYSDOT, NYSAGM, and NYSDPS; and

vi. provide the Construction NOI to persons who own properties that are crossed by or abut the Project Corridor. The Certificate Holder shall give such notices by affixing them to the doors of residences or by mailing the notices via United States Postal Service Mail. The Certificate Holder shall file a copy of the generic form of the Construction NOI to the Secretary prior to the Commencement of Construction and shall post the same to the Project website.

b. The Construction NOI shall be written in language reasonably understandable to the average person and shall contain:

i. a map and a description of the Project;

ii. the anticipated date for the start of construction;

iii. the name, address, toll-free telephone number, and email address of the Certificate Holder;

iv. a description of where to get more information about the Project including the Project website address and the location of document repositories; and

v. a statement that construction of the Project is under the jurisdiction of the Commission, which is responsible for enforcing compliance with environmental and construction conditions, and which may be contacted at an address and telephone number to be provided in the notice.

66. The following pre-construction meeting requirements shall apply to the Certificate Holder:

a. At least 14 days prior to the Commencement of Construction, the Certificate Holder shall hold a pre-construction meeting. An agenda, location, and invitation list shall be agreed upon among NYSDPS staff and the Certificate Holder. The Certificate Holder shall consult with NYSDPS and NYSDEC prior to finalizing the date of the meeting. The Certificate Holder shall provide notice of the meeting to all invitees at least 10 days prior to the meeting date;

b. Maps showing designated travel routes, construction worker parking and access road locations, and a general Project schedule will be available at the meeting for the attendees;

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c. The invitation list shall include at a minimum the onboarded contractors, NYSDPS, NYSDEC, NYSDOT, NYSDOS, NYSAGM, LIPA and/or PSEG-LI, the Suffolk County DPW, and any impacted utility; and

d. The Certificate Holder shall supply draft minutes from this meeting to all attendees, the attendees may offer corrections or comments, which the Certificate Holder will consider in good faith, and the Certificate Holder shall issue the finalized meeting minutes to all attendees and invitees and the LICFA.

67. The Certificate Holder shall provide contractors providing services for construction of the Project with complete copies, including any amendments and modifications, of the Certificate, the EM&CP, the Order(s) approving the EM&CP, any permit issued pursuant to Section 404 of the federal Clean Water Act, the Section 401 Water Quality Certification, and the federal consistency decision(s) issued pursuant to the federal Coastal Zone Management Act.

a. If, for any reason, the construction contractor cannot finish the construction of the Project, and a new construction contractor is needed, the Certificate Holder shall hold another pre-construction meeting using the same format as outlined above.

68. At least 14 days (or as authorized by NYSDPS) before construction of the onshore transmission cable begins in any area, the Certificate Holder shall, in such area: (a) delineate both edges of the onshore transmission cable corridor, as certified, where not otherwise in a roadway; (b) stake and/or flag all Project Corridor access roads and all work pads and pulling pads; (c) where Certificate Holder has a right of access, use markers to delineate, other than in beach and ocean areas, all Environmentally Sensitive Areas including, but not limited to, wetlands and the 100 foot adjacent and setback areas associated with regulated freshwater wetlands and the 300 foot adjacent areas associated with regulated tidal wetlands, threatened or endangered species habitat, contaminated soil areas, etc. and such markings will be left in place, and restored if disturbed, until complete of construction activities and restoration in the impacted area; (d) flag any danger trees to be removed in such area for review and comment by NYSDPS and NYSDEC; and (e) notify NYSDPS and NYSDEC when the above-described field stake-out is complete in such area.

69. During construction, the Certificate Holder shall provide NYSDPS, NYSDOT, NYSAGM, and NYSDEC with weekly status reports transmitted by electronic mail summarizing construction and indicating construction activities and locations scheduled for the following 14 days.

70. The Certificate Holder shall file a letter with the Secretary confirming that the Project has achieved commercial operation, defined as the date on which energy is sold in commercial quantities, excluding test energy, and is transmitted through the Project, no later than 10 days after the COD.

71. Final restoration of the Project site, in accordance with the Certificate Condition 208 and approved EM&CP, may occur in phases in order to comply with required work windows and other restrictions. Where final restoration will not occur until a subsequent construction phase, the area shall be stabilized until final restoration can be achieved. Within 10 days of the completion of phase of the final restoration of the Project for each of the onshore transmission cable, SRWEC–NYS, OnCS–DC, onshore interconnection cable, and the Holbrook Expansion, the Certificate Holder shall file notice with the Secretary that all restoration for that phase has been completed in compliance with this Certificate and the EM&CP, and shall demonstrate that all other locations have been stabilized until the commencement of the following phase of construction. The Certificate Holder shall periodically monitor the site during the non-construction season to ensure that areas that have not achieved final restoration remain adequately stabilized. The timing of such periodic monitoring shall be described in the EM&CP. Corrective measures shall be implemented as soon as practicable for any locations where stabilization is observed to be inadequate.

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G. **Construction Maintenance Windows and Timing**

72. Construction and scheduled maintenance work at the Landfall Work Area and Intercoastal Waterway (ICW) crossing shall be confined to the period beginning the day after Labor Day and ending on the day before Memorial Day of the succeeding calendar year, unless further restricted by the applicable Host Community Benefit Agreement.

73. After Labor Day, Certificate Holder's construction efforts will not prevent the public from accessing the parking lot on Smith County Park. Similarly, the Certificate Holder's construction efforts will not prevent the public from accessing the fishing pier on Smith County Park unless temporarily necessary for safety purposes (e.g., movement of equipment near access point to the fishing pier). Temporary closures of the fishing pier for safety purposes shall be limited to the maximum extent practicable as detailed in the EM&CP.

74. Installation of any Project HDD may be performed on a 24-hour, 7 days a week basis, subject to any applicable construction date restrictions and any applicable Construction Noise Control Plan appended as Appendix K to the Joint Proposal, if necessary to prevent damage to or loss of the bore hole. Installing the conduit and pulling the cable through the conduit and cable splicing may be performed on a 24-hour, 7 days a week basis subject to any applicable construction date restrictions and any applicable Construction Noise Control Plan. The Certificate Holder shall provide notice to the Town 48 hours prior to the commencement of all HDD drilling, installation of an HDD conduit, and pulling of cable through an HDD conduit.

75. Species Related Work Restrictions

a. Atlantic sturgeon. No in-water seabed disturbing work, including jet trenching trials, but not including installation and decommissioning or operation of the Equipment (as defined in Conditions 75 [d] and 81), shall occur between May 1 to June 30 and September 1 to November 30 in any year to avoid the risk for incidental take of Atlantic sturgeon, except that the Certificate Holder may be permitted to perform the following, limited seabed disturbing work activities diver clearance and maintenance in HDD exit to locate and prepare HDD conduit end using a crane-deployed, diver-operated jetting tool; cable pull through HDD conduit; and backfill of the HDD exit with sediment or appropriate secondary protection between May 1 through May 15 and November 1 through November 30. In addition, between November 1 and November 30, the Certificate Holder shall be authorized to position and anchor vessels and place the jack-up barge or similar supporting vessel to be used in connection with HDD Drilling Operations, however the in-water punch out will not occur prior to November 30. If backfill of the HDD exit or remedial burial/secondary cable protection installation and defect remedy occurs during the restricted window (May 1 to June 30 or September 1 to November 30, Certificate Holder shall develop an Atlantic Sturgeon Monitoring and Impact Minimization Plan. Such Atlantic Sturgeon Monitoring and Impact Minimization Plan must meet the substantive requirements of 6 *NYCRR* Part 182, and shall be included as part of the post-Phase 1 EM&CP. If applicable, the Certificate Holder shall provide the Atlantic Sturgeon Monitoring and Impact Minimization Plan to NYSDEC 45 days prior to filing of the post-Phase 1 EM&CP for NYSDEC's review and comment.

b. Northern Long-Eared Bat. In order to ensure that the Project complies with the requirements of Article 11 of the ECL and 6 *NYCRR* Part 182 for northern long-eared bats (NLEB):

i. No Project component shall be sited or located within 150 ft (46 m) of any known northern long-eared bat maternity roost, or within 0.25 mi (0.4 km) of any known northern long-eared bat hibernaculum.

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ii. No tree clearing activities shall occur at any time within 150 ft (46 m) of any NLEB maternity roosts or 0.25 mi (0.4 km) of any NLEB hibernacula. All tree clearing activities occurring greater than these distances but within 1.5 mi (2.4 km) of a NLEB detection or 5 mi (8 km) of a NLEB hibernaculum site shall be conducted between December 1 and February 28.

iii. If the conditions specified in Certificate Conditions 75 (b) (i) and (ii) cannot be met, the Certificate Holder shall consult with NYSDEC and, if applicable, USFWS, to determine what, if any, permits and/or additional authorizations are required.

iv. From March 1 to November 30, the Certificate Holder shall leave uncut all snag and cavity trees as defined under NYSDEC Program Policy ONRDLF-2 Retention on State Forests, unless their removal is necessary for the protection of human life and property. When necessary, snag and cavity trees may be removed after being cleared by the environmental monitor, who shall conduct a survey for bats exiting the tree. This survey shall begin 1/2 hour before sunset and continue until at least 1 hour after sunset or until it is otherwise too dark to see emerging bats. Unoccupied snag and cavity trees in the approved clearing areas shall be removed within 24-hours of the exit-count survey.

v. If at any time during the life of the Project any NLEB maternity roost trees are discovered, NYSDEC will be notified within 24 hours of discovery, and an area of at least 500 ft (152 m) in radius around the roost tree(s) shall be marked and avoided until notice to continue construction, ground clearing, grading, maintenance or restoration activities, as applicable, at that site is granted by NYSDPS after consultation with NYSDEC, except if necessary for the protection of human life and property.

vi. Except as otherwise specified, if it is determined to be necessary to take occupied habitat or individuals of NLEB, the Certificate Holder will develop a Net Conservation Benefit Plan in consultation with and accepted by NYSDEC and NYSDPS that satisfies the requirements of 6 *NYCRR* Part 182.

c. Nesting Shorebirds. No on-beach work (i.e., between the back dune and Mean Low Water) shall occur between April 1 and August 31 in any year to avoid the risk for incidental take of federally- and State-listed nesting shorebirds. This time of year restriction does not prohibit the Certificate Holder from performing construction work at the Landfall Work Area or the ICW Work Area. From April 1 to August 31, while construction is occurring at the Landfall Work Area or ICW Work Area, the Certificate Holder will immediately notify the NYSDEC if its environmental monitor, as described in Condition 122 (a), observes nesting behaviors by any above-referenced nesting shorebird within 500 ft (152 m) of the Landfall Work Area or ICW Work Area.

d. Winter Flounder: Aside from the activities outlined herein, no in-water seabed disturbing activities shall occur in the ICW between December 15 and May 31 ("Winter Flounder restricted window") in any year. This time of year restriction will not prevent the Certificate Holder from installing or decommissioning temporary, in-water equipment or structures in the ICW (the Equipment, see also Certificate Condition 81) to facilitate the construction of the Project within the Winter Flounder restricted window in any year during construction of the Project. If installation or decommissioning of the Equipment occurs during the Winter Flounder restricted window, the Certificate Holder shall develop a Winter Flounder Monitoring and Minimization Plan in consultation with NYSDEC. The Certificate Holder shall provide the Winter Flounder Monitoring and Minimization Plan to NYSDEC 45 days prior to filing of the post-Phase 1 EM&CP for NYSDEC's review and comment. If, in consultation with NYSDEC, it is determined that the Equipment will result in the take of winter flounder, then the Certificate Holder shall implement a Winter Flounder Net Conservation Benefit

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Plan (NCBP) that meets the requirements of 6 *NYCRR* Part 182. The Winter Flounder NCBP, if necessary, shall be submitted to NYSDEC for review and acceptance prior to filing with the Secretary and Commencement of Construction in the relevant area.

e. If any T&E species, as defined in 6 *NYCRR* Part 182 or plant species identified under 6 *NYCRR* Part 193 are encountered on the onshore portion of the Project Corridor the following actions shall be taken:

i. NYSDPS and NYSDEC shall be notified within 24 hours of discovery (or as soon as possible, in the event that more than 24 hours are needed to compile the required details for such reports/notifications) if the environmental monitor confirms a nest, roost, or area where the species were seen exhibiting any breeding or roosting behavior. In turn, and unless continued operations are necessary for protection of human life or property, the Certificate Holder shall secure the area where rights exist and safely cease construction in that area until NYSDPS, in consultation with NYSDEC, authorizes recommencement of activities;

ii. Excluding bald eagles and unfledged piping plover chicks an area at least 500 ft (152 m) in radius around the active nest or roost shall be posted and avoided until notice to continue construction, ground clearing, grading, maintenance, or restoration activities are granted by NYSDPS and NYSDEC;

iii. An area at least 1,000 m (3,280 ft) in radius (from the ocean-side low water line or the farthest extent of dune habitat) around the active nest with unfledged piping plover chicks shall be identified and any on-beach areas as defined in Condition 75 (c) within that radius will be avoided until notice to continue construction, ground clearing, grading, maintenance, or restoration activities has been granted by NYSDPS and NYSDEC. Further, any on-beach areas as defined in Condition 75 (c) within that radius that are also within the Project Corridor will be posted by the Certificate Holder;

iv. For bald eagles, an area at least 660 ft (200 m) in radius with a visual buffer, or 0.25 mi (0.4 km) with no visual buffer, around the active nest or roost shall be posted and avoided until notice to continue construction, ground clearing, grading, maintenance or restoration activities are granted by NYSDPS and NYSDEC; and

v. The active nest(s) or nest tree(s) or roost(s) shall not be approached under any circumstances unless authorized by NYSDPS and NYSDEC.

f. Record All Observations of NYS Threatened or Endangered Species. During construction, restoration, operation and maintenance of the facility and associated facilities, the Certificate Holder shall maintain a record of all observations of NYS threatened, or endangered species as follows:

i. Construction. During construction, the on-site environmental monitor shall be responsible for recording all occurrences of NYS threatened or endangered species within the Project Corridor. All occurrences shall be reported in a biweekly monitoring report submitted to the NYSDPS and NYSDEC and such reports shall include the information described in subparagraph (iii) of this paragraph. If a NYS threatened or endangered bird species is demonstrating breeding or roosting behavior, it shall be reported to the NYSDPS and NYSDEC within twenty-four (24) hours (or as soon as possible, in the event that more than 24 hours are needed to compile the required details for such reports/notifications).

ii. Post-Construction Restoration. After construction is complete, incidental observations of any NYS threatened or endangered species shall be documented and reported to the NYSDPS and NYSDEC, in accordance with the reporting requirements in subparagraph (iii) of this paragraph.

iii. Reporting Requirements. All reports of NYS and/or federally threatened or endangered species shall include the following information: species; number of individuals; age and sex of individuals (if known); observation date(s) and time(s); Global Positioning System (GPS) coordinates of each

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individual observed (if operation and maintenance staff do not have GPS available; the report shall specify the nearest road or cross roads location); behavior(s) observed; identification and contact information of the observer(s); and the nature of and distance to any facility construction, maintenance or restoration activity.

76. Construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m. Monday through Saturday, except for construction activity in connection with any HDD; cable pulling, grouting, and laying, cable joint splicing; OnCS–DC work, and other activities reasonably necessary to comply with NYSDOT or other contractual restrictions on daytime construction in or along roadways or public access areas. In addition to the aforementioned exceptions, this restriction shall not require the cessation of construction activities that require a continuous work effort once started (e.g., commissioning the OnCS–DC), including those specifically delineated in Section 7.2.4 of Record Exhibit 8, which requests the ability to perform certain continuous construction activities on County property. In such an event, except in cases of emergency, the Certificate Holder shall notify NYSDPS and adjacent landowners and businesses. Such notice shall be given at least 24 hours in advance unless the construction activities to be performed on a Sunday or after 7:00 p.m. are required for safety reasons that arise less than 24 hours in advance. The Certificate Holder shall implement construction noise mitigation measures set forth in the EM&CP.

77. The Certificate Holder shall use best efforts to complete onshore deliveries related to construction activities between 7:00 a.m. and 7:00 p.m., except for cable, oversized deliveries, and deliveries necessary to complete construction that are otherwise authorized to occur on a Sunday or after 7:00 p.m. This Condition is not intended to prohibit nighttime deliveries reasonably necessary to facilitate compliance with NYSDOT or other contractual restrictions on daytime construction in or along roadways or public access areas or to require the cessation of construction activities that require a continuous work effort once started.

78. After consultation with the NYSDEC, NYSDOS, and NYSDPS, the Certificate Holder may petition the Commission for a modification of any construction window limitation by filing such petition with the Secretary. Such petition shall describe the consultation efforts and results of the Certificate Holder and shall include a request for a 30-day public comment period unless NYSDPS agrees that ongoing construction activities cannot reasonably be paused to accommodate a comment period.

H. **SRWEC–NYS Construction**

79. Prior to the Commencement of Construction of the SRWEC–NYS, the Certificate Holder will engage in certain offshore site preparation. Offshore site preparation shall include the following activities, which the Certificate Holder will describe in more detail (e.g., provide methods, locations, and impact minimization measures) in the EM&CP:

a. Boulder removal through the use of a boulder grab, which will be minimized to the maximum extent practicable, will be conducted in accordance with Condition 80.

b. Pre-lay grapnel run.

80. Exclusive of the portion of the cable installed via HDD, the Certificate Holder shall install the SRWEC–NYS a minimum of 6 ft (1.8 m) (measured from top of cable) below the seabed (target burial depth). Should the target burial depth not be achieved during the initial pass of the cable installation tool that is best suited to achieve target burial depth, the Certificate Holder shall perform up to two additional passes with the installation tool, or other burial tool that

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complies with the requirements of the Certificate, unless (a) additional passes risk causing damage to the SRWEC–NYS or the installation tool; or (b) due to geologic obstructions, additional passes would not increase the burial depth or risk causing cable exposure (actual burial depth). Certificate Holder shall use best efforts to micro-route the cable within the cable corridor to achieve target burial depth during installation. If boulders are not identified during pre-construction surveys, and therefore micro-routing the cable is impracticable, the Certificate Holder shall, if required to increase the likelihood of achieving target burial depth, relocate any encountered boulders within 50 ft (15 m) of the planned centerline of the cable. Where Certificate Holder has relocated a boulder 3 ft (1 m) or more in diameter a distance of 6 ft (2 m) or more from the location where it was initially encountered, Certificate Holder shall provide electronic notice to mariners, recreational fishermen, and NYSDEC-Licensed Fishermen in accordance with Appendix J. The SRWEC–NYS shall be maintained in accordance with the Cable Monitoring and Management Plan included in the approved EM&CP (Conditions 137 and 138).

81. Certificate Holder will install in the ICW and utilize the Equipment during the construction of the Project to facilitate the movement of construction equipment and materials to the Landfall Area. The Equipment will generally be located as shown in Appendix B to the Joint Proposal. The applicable EM&CP will provide a detailed assessment of how the Equipment avoids or minimizes impacts to the environment to the maximum extent practicable considering alternative methodologies. More specifically, the EM&CP will describe how the Equipment first avoids, and if avoidance is not possible, minimizes impacts related to: (1) the seafloor, (2) shading, and (3) SAV. This assessment will include details regarding how the floating pier component of at least one of the considered options for the Equipment could be designed and constructed to avoid repetitive touching of or resting on the seafloor. Certificate Holder will similarly order Equipment to be the minimum size necessary to safely accommodate construction of the Project. In addition, the EM&CP will detail why the Equipment is most suitable for the site, including the Equipment's ability to handle: ice loads; wind and erosion; tidal flux; and existing uses, grades, and bathymetry. Further, the EM&CP will explain why the Equipment is suitable for the duration of need to construct the Project, why it provides a safe work area, and how it reduces human safety hazards. This assessment of the Equipment will be provided to NYSDPS, NYSDEC, NYSDOS, and AGM 45 days prior to the filing of the EM&CP.

82. Pipe stringing will occur on Burma Road. No grading will occur to complete the pipe stringing activity. The final location of pipe stringing consistent with this Condition will be included in the post-Phase 1 EM&CP and is preliminarily reflected on Appendix B to this Joint Proposal. Aside from the short period of time that the Certificate Holder will pull the pipe into the water or otherwise for public safety, recreational access to the area surrounding the pipe stringing activity will be preserved. When the pipe is pulled into the water, rollers will be used as appropriate.

83. The Certificate Holder will develop an Anchoring Plan to be provided in each applicable phase of the EM&CP that will discuss how the use of anchoring, if any, during construction and maintenance activities will avoid and/or minimize impacts to sensitive benthic habitats (Condition 89) and Significant Coastal Fish and Wildlife Habitats (e.g., use of vessels equipped with dynamic positioning systems, installing mid-line buoys) and avoid impacts to existing buried assets (e.g., telecommunications cables). The Anchoring Plan will outline the parameters for the use of anchors and spuds and identify discrete "No Anchor" areas within the corridor outlined in Appendix B in the event anchoring is ultimately required. Mid-line buoys or alternative measures shall be employed to minimize sediment disturbance caused by anchor sweeps during construction of the SRWEC–NYES, as will be described in the Anchoring Plan. The Certificate Holder shall provide the Anchoring Plan at least 45 days prior to filing the EM&CP to NYSDPS, NYSDOS, and NYSDEC for review and comment.

84. In the event of an anchor strike with the SRWEC–NYS, the Certificate Holder shall notify NYSDPS no later than 48 hours and subsequently file a letter with the Secretary identifying the details of the incident and anticipated next steps as soon as that report is finalized.

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85. The Certificate Holder shall utilize the Smith Point Bridge as often as possible to transport equipment and materials to the Landfall HDD Work Area. Ultimately, decisions as to what equipment and materials can be transported over the Smith Point Bridge will be made by the County.

86. The Certificate Holder agrees to minimize utility crossings along the SRWEC–NYS route to the maximum extent practicable.

87. Certificate Holder shall install the SRWEC–NYS, exclusive of the Landfall HDD and offshore HDD exit, using either simultaneous lay and burial or pre-lay and post-burial processes.

a. The following processes may be used, individually or in combination, to install the SRWEC–NYS, exclusive of the HDD: mechanical cutter, mechanical plow (which may include a jetting system), jet sled, jet trencher, controlled flow excavator, boulder grab, and/or trailing suction hopper dredge.

88. Certificate Holder will use best efforts to avoid the use of cable protection if the actual burial depth achieved provides adequate protection. In areas where seabed conditions, geologic or topographic features, or utility crossings do not allow Certificate Holder to achieve target burial depth, Certificate Holder is authorized, but not required, to use cable protection methods. Cable protection may include tapered engineered concrete mattresses, rock bags, or crushed rock. Certificate Holder shall install and maintain any necessary cable protection measures in a manner that is consistent with the objectives of Condition 56 (d), (e) (i.e. ability to maintain overtrawlability, minimize shifting over time, and avoids creating a discernable berm). Following construction of the SRWEC–NYS, Certificate Holder shall not leave any portions of the cable exposed on the seabed without cable protection measures unless otherwise authorized by these Certificate Conditions or the EM&CP. As part of decommissioning, the Certificate Holder shall survey and use best efforts to remove installed cable protection measures that are within 2 ft (0.6 m) of the seabed surface.

89. Unless otherwise authorized by the Certificate or the EM&CP, the Certificate Holder must avoid impacts to sensitive benthic habitats (i.e., hard bottom habitat, commercial shellfish beds, salt marsh, submerged aquatic vegetation, and corals) in NYS.

90. In-water activities shall be undertaken in a manner that minimizes the potential for interference with navigation, and other water-dependent uses of the area, including but not limited to fishing, boating, and recreation.

91. The Certificate Holder may use a casing pipe, or similarly Commission-approved containment structure (collectively referred to as Temporary Containment), or no containment structure, around the offshore HDD exit during construction. Final details regarding whether a Temporary Containment will be used, and, if so, the type, design, and installation method shall be included in the EM&CP. Any Temporary Containment shall be fully removed prior to the COD, but no longer than 30 days after the installation of the cable in NYS waters. If a Temporary Containment is used, the Certificate Holder shall provide electronic notice of its location to mariners, recreational fishermen, and NYSDEC-Licensed Fishermen in accordance with Appendix J, and any Temporary Containment will be marked in accordance with applicable USCG requirements.

92. The SRWEC–NYS Landfall HDD will be installed at a depth that will provide sufficient cable burial and at a minimum of 6 ft (1.8 m) below the seafloor, exclusive of the transition points associated with the entry and exit positions of the HDD, whereby the conduit will be buried below surface level upon completion. The TJB shall be located underground within the parking lot of the Smith Point County Park on Fire Island in the Town of Brookhaven with two maintenance hole covers at the surface.

93. The following sub conditions apply to all Project HDDs:

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a. The Certificate Holder shall include, as part of the post-Phase 1 EM&CP, an Inadvertent Returns Plan that provides for the detection and correction of accidental releases of drilling fluids, as well as the Safety Data Sheets (SDS) for the drilling fluids;

b. Certificate Holder shall use best efforts to recover and dispose of all HDD drilling fluids and cuttings as specified in Condition 197;

c. Certificate Holder shall not intentionally release and shall use best efforts to prevent the inadvertent release of HDD drilling fluids or cuttings outside the confines of the HDD operation. Certificate Holder shall comply with the Inadvertent Returns Plan as described herein to mitigate and minimize the impacts of any such releases; and

d. All drilling fluid additives must be water-based unless otherwise approved by NYSDPS in consultation with NYSDEC. If a polymer-based additive is proposed, it must be included in the EM&CP with the corresponding SDS containing ecotoxicity information and approved NYSDEC Water Treatment Chemical Form. Petroleum-based additives are strictly prohibited. If a polymer-based additive is proposed, the Certificate Holder will propose to use a biodegradable polymer-based additive if a suitable product exists.

94. With respect to the Landfall HDD, ICW HDD, and SRWEC–NYS, no changes in the installation technology or reduction in the minimum depths specified in these Conditions shall be allowed without prior consultation with NYSDEC and a written statement from NYSDOS stating that the deviation would not result in coastal effects that differ significantly from the coastal effects reviewed by NYSDOS in Certificate Holder's original federal Coastal Consistency Certification. If NYSDOS determines that such deviation would result in coastal effects that differ significantly from those reviewed in the Coastal Consistency Certification, the Certificate Holder shall seek a written concurrence from NYSDOS for any such Project changes that would require an amendment to the Certificate Holder's Coastal Consistency Certification. Nothing in this Certificate shall be construed to limit or expand any rights the Certificate Holder may have to seek administrative or judicial review of any action or inaction by NYSDOS relating to any such deviation.

95. During construction activities at the offshore HDD exit, the Certificate Holder shall provide to NYSDPS, NYSDEC, and NYSDOS weekly progress reports that document compliance with Certificate requirements and such other information as determined necessary based on consultation with those agencies.

a. All work activities will be closely coordinated with the USACE, the USCG; and applicable federal, State, and local agencies and other local pilot associations, as Certificate Holder determines determined to be necessary to minimize or avoid impacts. This coordination process will be detailed further in the Certificate Holder's post-Phase 1 EM&CP and identify any coordination of the requirements in Appendix J.

I. Onshore Transmission Cable Construction

96. Unless otherwise required by the underlying property owner, the onshore transmission cable will be installed in an underground duct bank consisting of concrete encased conduits, utilizing cable vaults for installation and maintenance access. Each vault will be accessible by up to two maintenance hole covers visible from the surface.

97. The method for installation of the onshore transmission cable within the NYSDOT ROW will be detailed in the Phase 1 EM&CP and comply with NYSDOT specifications. Prior to filing the EM&CP, the Certificate Holder shall consult with the NYSDOT.

98. Certificate Holder shall instruct its contractors to park in designated areas identified in the EM&CP pursuant to Conditions 66 (b) and 120.

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99. The Certificate Holder shall use best efforts to minimize vegetation disturbance and removal within the NYSDOT- and County-owned highway ROW and Town-owned ROW.
100. The Certificate Holder shall coordinate construction activities with other construction and maintenance activities taking place at the same time and in the same vicinity by the NYSDOT and county, local highway departments, and the Long Island Railroad (LIRR). Where the proposed cable route intersects with planned or ongoing transportation infrastructure improvements, cable design, installation methods and installation schedule will be planned to accommodate those transportation facilities. Details of construction schedule planning and coordination with these entities shall be included in each applicable EM&CP.
101. Unless otherwise necessary for safety purposes, the Certificate Holder shall maintain continual pedestrian and vehicular use of and access to park amenities within Smith Point County Park on Fire Island, Smith Point County Marina, Southaven County Park in the Town of Brookhaven, and all other existing public access areas.
102. Certificate Holder shall design, engineer, and construct the Project in accordance with the applicable and published planning and design standards of the New York Independent System Operator, Inc.; New York State Reliability Council; the Northeast Power Coordinating Council; the North American Electric Reliability Corporation; and successor organizations.
103. The Certificate Holder shall coordinate with LIPA and/or PSEG-LI to minimize outages. In the event a customer outage is necessary to facilitate construction, Certificate Holder will confidentially file notice of the same with the Commission's Records Access Officer. Within 60 days of Commission issuance of a Certificate, begin the process of consulting with LIPA and/or PSEG-LI regarding the Project's construction schedule to, among other things, coordinate system outage requirements, if any, and avoid or minimize conflicts with LIPA's and/or PSEG-LI's internal construction programs.
104. The Certificate Holder shall be responsible for inspecting all culverts within the Project Corridor and determine that they are not crushed, blocked, or otherwise damaged by the Certificate Holder during construction, restoration, and/or decommissioning of the Project. If such culvert is blocked, crushed, or otherwise damaged by the Certificate Holder or its contractors during construction, restoration, and/or decommissioning, the Certificate Holder shall, where feasible, immediately, repair the culvert or replace it with alternative measures appropriate to maintaining proper aquatic connectivity and stream or stormwater flows. Culvert repairs or replacement must not result in reduced opening width or height.
105. The Certificate Holder shall thoroughly clear the areas of debris on the onshore transmission cable related to underground electric line construction.
106. The Certificate Holder shall take appropriate measures, as outlined in the EM&CP, to minimize fugitive dust and airborne debris from construction activities. Except where such activities may create ice, exposed soils and roadways shall be wetted as needed during extended dry periods to minimize dust generation. To the extent practicable, water for dust control shall come from municipal water supplies/sources. If contamination in the ground is detected during construction of the onshore transmission cable and OnCS–DC, and such contamination is of the kind that will lead to volatilization or off-gassing of such contamination or chemical constituents thereof, the Certificate Holders shall contact NYSDOH, NYSDEC, and NYSDPS prior to further disturbance. Additionally, the Certificate Holder shall conform to practices and procedures described in the DER-10/Technical Guidance for Site Investigation and Remediation and the NYSDOH Generic Community Air Monitoring Plan (CAMP), to the extent applicable.

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107. Following construction, the onshore Project Corridor as impacted by the Certificate Holder or its contractors shall be restored to pre-construction contours, unless the EM&CP specifies otherwise. Erosion controls and permanent vegetation shall be restored as appropriate for those locations. Disturbed pavement, curbs, and sidewalks (if applicable) shall be restored by Certificate Holder to their pre-construction condition or improved, or as otherwise addressed in an applicable agreement with the local government.

108. The Certificate Holder shall file with the Secretary as-built drawings of the Project, certified by a Professional Engineer or Licensed Land Surveyor that is licensed in New York State showing the final installation route and location of the Project as defined in Appendix B within 120 days following the COD. At the same time the as-built drawings are provided to the Secretary, the accompanying GIS files will be provided to NYSDPS, NYSDEC, NYSDOS, NYSDOT, and AGM.

109. Certificate Holder shall, upon completion of construction of the Project:

a. Conduct an assessment of the need for additional restoration work and landscape improvements, including vegetation planting, earthwork or installed features to screen or landscape at the OnCS–DC. Landscape improvement assessments shall be conducted in consultation with the Town and landowners where applicable.

b. Prepare plans for any visual mitigation found necessary, and, in connection therewith, removal, rearrangement and supplementation of existing landscape improvements or plantings should be considered, as appropriate.

c. Present draft assessments and visual mitigation plans to NYSDPS for review and comment, and file a final plan with the Secretary within 1 year after the date the Project is placed in service.

d. Install, as appropriate, visual mitigation measures as identified in final plans as outlined in (a) through (c), above.

110. A Highway Work Plan governing activities within highway ROW, prepared in coordination with the municipal highway departments, NYSDOT and NYSDPS, and in compliance with 17 *NYCRR* Part 131, shall be included in each applicable EM&CP, and shall cover at a minimum:

a. an estimated schedule showing the sequence and duration of trenching, drilling and/or pipejacking, cable delivery and laying, backfilling, splicing, and testing;

b. a traffic diversion/lane closure plan, as described in Condition 43 (d), which shall identify procedures to be used to maintain traffic and provide a safe construction zone for those activities within the roadway ROW. The plan shall also describe temporary signage, lane closures, placement of temporary barriers and traffic diversion. Flaggers shall always be present when equipment is crossing any road, when equipment is being loaded or unloaded, and where two-lane traffic has been reduced to one lane;

c. coordination with planned highway and bridge construction, as described in Condition 43 (f), and repair projects;

d. a map showing the location of: the trench with reference to the paved highway surface, lay down and mobilization areas, drilling and HDD exit, pipejacking entry and exit, and splicing locations;

e. trench profile;

f. a plan for trench backfilling, marking and protection, and temporary covering; and

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g. a plan for trenching and cable laying in the vicinity of other underground utility lines, conduits and pipes.

J. **Contractors and Contractor Supplies/Materials**

111. The Certificate Holder shall notify all contractors that the Commission may seek to recover penalties for violation of the Certificate, not only from the Certificate Holder, but also from its contractors, and that contractors may also be liable for other fines, penalties, and environmental damage caused by their actions.

112. The Certificate Holder's employees, contractors, and subcontractors assigned to the construction of the Project shall be properly trained in their respective responsibilities.

113. At least 14 days prior to construction, the Certificate Holder shall file a report with the Secretary confirming that required construction materials are available. For purposes of this paragraph, an item of construction material is available: (i) if it is located at a marshalling yard; (ii) if it is in a Certificate Holder warehouse or other routine Certificate Holder inventory stocking location; or (iii) if it is on order from a vendor with a scheduled delivery date prior to the time scheduled for its use in the Project.

114. All equipment shall be located at the laydown yard, work area, or on the Project Corridor, provided, however, that if a local contractor is used for the work, the local contractor's facility shall be considered as a marshalling yard or laydown area.

115. If an Occupational Safety and Health Administration (OSHA)-recordable construction accident (e.g., loss of consciousness and fractured bone) in connection with work on the Project, the Certificate Holder shall report any such accident to NYSDPS as soon as possible, but no later than 24 hours after Certificate Holder becomes aware of such accident. A copy of the accident report, if any, shall be provided to NYSDPS after it has been finalized.

116. If a contractor installs materials, structures, or components that do not meet or exceed the specifications for the same described in the approved EM&CP, the Certificate Holder shall immediately notify NYSDPS of the deviation. The Certificate Holder will develop in consultation with the NYSDPS plans for remedial action, and within 30 days after becoming aware of such deviation, the Certificate Holder shall prepare and deliver to NYSDPS a summary report detailing the deviation and the steps to be, or that have been, taken to address the deviation.

117. The Certificate Holder shall develop a Quality Control Plan for inclusion in the Phase 1 EM&CP describing how it will ensure that the transmission line structures and components it purchases for the Project conform to the specification for structures and components described in the approved EM&CP. At a minimum, the Quality Control Plan shall include: (i) the name(s), if available and qualifications of the individual(s) who will conduct audits under the Quality Control Plan (Quality Control Audits); and (ii) the frequency with which the Quality Control Audits will be performed.

118. Within 10 business days following completion of each Quality Control Audit, the Certificate Holder shall provide to NYSDPS a report of such audit that includes: (i) a description of the results of the audit, particularly with respect to results that identify that one or more structures or components the Certificate Holder purchased for installation in the Project did not conform to the specifications for structures or components described in the approved EM&CP; and (ii) any notes pertinent to the subject matter of such audit which were made at audit meetings by Certificate Holder personnel and/or contractors who performed the audit.

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119. If any Quality Control Audit conducted by the Certificate Holder identifies that one or more structures or components the Certificate Holder purchased for installation in the Project did not conform to the specification for structures and components described in the approved EM&CP, the Certificate Holder shall: (i) provide written notification to the Secretary within not more than 72 hours of the Certificate Holder's discovery of such non-conformity; and (ii) describe the steps the Certificate Holder will take to correct the non-conformity, including whether any components must be dismantled and returned to the manufacturer. 120. The Certificate Holder shall avoid direct disturbance to properties by accessing the Project from existing roadways or off-ROW access roads as identified in the EM&CP. Parking for Project construction workers shall be in designated areas identified in the EM&CP that do not interfere with normal traffic, cause a safety hazard, or interfere with existing land uses. Certificate Holder shall minimize on-site parking for workers where practicable. If a designated parking area is required within NYSDOT ROW, NYSDOT will be consulted on the location prior to filing the EM&CP.
K. **Oversight and Supervision**
121. During construction, the Certificate Holder shall retain at least five individual monitors for Project oversight, as follows: a. One independent, third party full-time environmental monitor. The Certificate Holder must assign at least one additional environmental monitor(s) for the duration of all in-water work if such work is undertaken simultaneously with onshore transmission cable and/or OnCS–DC construction activities (Aquatic Environmental Monitor). The environmental monitor must be on-site during all construction activities that take place outside of the time period 7:00 a.m. to 7:00 p.m. b. One independent, third party full-time Fishing Interests Monitor/Representative. The monitor must be on-site during all construction activities that take place in NYS commercial fishing waters; c. One full-time construction supervisor; d. One full-time safety inspector; and e. One full-time quality assurance inspector. 122. Fourteen (14) days in advance of Project construction, the Certificate Holder shall provide an Environmental Compliance Plan regarding the environmental monitor to NYSDPS and NYSDEC for review and comment. The Environmental Compliance Plan must include the following information: a. The Certificate Holder shall ensure that the names and qualifications of its environmental monitor, Aquatic Environmental Monitor, Fishing Interests Monitor/Representative, safety inspector, quality assurance inspector, and construction supervisor are submitted to NYSDPS at least 2 weeks prior to the start of construction of the Project. The Certificate Holder shall ensure that its environmental monitor's qualifications satisfy those of a "Qualified Inspector" pursuant to the SPDES General Permit. b. Organization structure, including specific names, duties, and responsibilities. c. Certification confirming the independence of the environmental monitor(s) from the Certificate Holder. d. The procedures established to ensure compliance with the Certificate and the applicable ECL provisions and implementing regulations.

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e. Environmental compliance tracking and reporting procedures, including:

i. Checklist of matters to inspect for compliance, including specific items or locations to be inspected and acceptability criteria to be applied by the environmental monitor(s);

ii. Purpose and frequency of reports;

iii. Environmental compliance schedule;

iv. Methods of reporting non-compliance with Certificate Conditions and the ECL and implementing regulations; and

v. QA/QC procedures for environmental compliance.

f. Procedure for the Certificate Holder to respond to and correct problems found by the environmental monitors.

123. During periods of relative inactivity on the Project, after consultation with and acceptance from NYSDPS, the Certificate Holder may temporarily decrease the number of hours worked by Project oversight personnel and the extent of their presence at the Project site commensurate with the decline in Project activity. Likewise, during periods of relatively high activity on the Project, the number of inspectors and the extent of their presence at the Project site may be temporarily increased commensurate with the increase in activity levels. The Certificate Holder shall ensure that the frequency of inspections by the environmental monitor(s) comply with the requirements of the SPDES General Permit.

124. Subject to Condition 128, the environmental monitor(s) shall have stop work authority over aspects of the Project that could violate the terms of the Certificate, EM&CP, or the § 401 Water Quality Certification.

125. The Certificate Holder shall provide to NYSDPS and the Town the cell phone numbers and weekly schedules of the Certificate Holder's environmental monitor(s), safety inspector, quality assurance inspector, and construction supervisor(s).

126. The environmental monitor(s) and construction supervisor(s) shall be equipped with sufficient documentation, transportation, and communication equipment to effectively monitor contractor compliance with the provisions of this Certificate, applicable sections of the PSL, ECL, and the Town's Code; the EM&CP; every Commission order issued in this proceeding; and the § 401 Water Quality Certification.

127. Subject to the requirements of Conditions 30 and 31, NYSDEC and NYSDOS representatives shall be permitted scheduled visits to the Project site.

128. The authority granted in the Certificate and any subsequent order(s) in this proceeding is subject to the following conditions necessary to ensure compliance with such order(s):

a.The Certificate Holder shall regard NYSDPS representatives (authorized pursuant to PSL § 8) as the Commission's designated representatives in the field. In the event of any emergency resulting from the specific construction or maintenance activities that violate or may violate the terms of the Certificate or any other order in this Proceeding, such NYSDPS representatives may issue a stop-work order for that location or activity.

b.A stop-work order shall expire in 24 hours unless confirmed by at least a single Commissioner. If a stop-work order is confirmed, the Certificate Holder may seek reconsideration from the confirming Commissioner or all Commissioners. If the emergency prompting the issuance of a stop-work order is

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resolved to the satisfaction of the Commissioner or the Commission, the stop-work order will be lifted. If the emergency has not been satisfactorily resolved, the stop-work order will remain in effect.

c.Stop-work authority will be exercised sparingly and with due regard to environmental impacts, economic costs involved, public health and safety, possible impact on construction activities, worker health and safety, and whether an applicable statute or regulation is violated. Before exercising such authority, NYSDPS representatives will, wherever practicable, consult with the Certificate Holder representatives possessing comparable authority. Within reasonable time constraints, all attempts will be made to address any issue and resolve any dispute in the field. In the event the dispute cannot be resolved, the matter will be immediately brought to the attention of the Certificate Holder, the Project manager, and the Director of the EC&C Section of the Office of Electric, Gas and Water. In the event that a NYSDPS representative issues a stop-work order, neither the Certificate Holder nor the contractor will be prevented from undertaking any such safety-related activities as they deem necessary and appropriate under the circumstances. The issuance of a stop-work order or implementation of measures, as described below, may be directed at the sole discretion of the NYSDPS representative during these consultations.

d.If a NYSDPS representative discovers that a specific activity is a significant environmental threat that is, or may immediately become, a violation of the Certificate, Water Quality Certification, or any other order in this Proceeding, the NYSDPS representative may—in the absence of responsible Certificate Holder supervisory personnel or the presence of such personnel who, after consultation with the NYSDPS representative, refuse to take appropriate action—direct the field crews to stop the specific environmentally harmful activity immediately. If responsible Certificate Holder personnel are not on site, the NYSDPS representative will immediately thereafter inform the supervisor and/or environmental monitor of the action taken. The NYSDPS representative may lift the stop-work directive if the situation prompting its issuance is resolved.

e.If the NYSDPS representative determines that a significant threat exists such that protection of the public or the environment at a particular location requires the immediate implementation of specific measures, the NYSDPS representative may, in the absence of responsible Certificate Holder supervisory personnel, or in the presence of such personnel who, after consultation with the NYSDPS representative, refuse to take appropriate action, direct the Certificate Holder or its contractors to implement corrective measures. The field crews shall comply with the NYSDPS representative directive immediately. The NYSDPS representative will immediately thereafter inform the Certificate Holder's supervisor or environmental monitor of the action taken.

129. Certificate Holder shall organize and conduct site compliance audit inspections for NYSDPS and NYSDEC, as needed, but not less frequently than once per month during the construction and restoration phases of the Project. Inspections shall conclude upon the final sign-off of the SWPPP by the SWPPP inspector.

a.Once per month, the inspection shall include a review of the status of compliance with all certification conditions, requirements, and commitments, as well as a field review of the Project site, if necessary. The inspection shall also include:

i.review of all complaints received, and their proposed or actual resolutions;

ii.review of any significant comments, concerns, or suggestions made by the public, local governments, or other agencies;

iii.review of the status of the Project in relation to the overall schedule established prior to the Commencement of Construction; and

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iv.other items the Certificate Holder or NYSDPS consider appropriate.

b.The Certificate Holder shall provide draft minutes of the inspection audit and/or meeting, including resolution of issues and additional measures to be taken, to NYSDPS and all attendees for corrections or comments. Thereafter, the Certificate Holder shall issue to NYSDPS and NYSDEC, the final written record of the results of the inspection audit as part of its scheduled construction update reports, describing resolution of issues and additional measures to be taken.

L. **Roads and Transportation**

130. The Certificate Holder shall coordinate all construction work on the onshore transmission cable with the appropriate State (including the NYSDOT Transportation Management Center in Hauppauge) and municipal officials and shall obtain the required authorization for such work, subject to the Commission's continuing jurisdiction as appropriate. The Certificate Holder shall periodically consult with State and local highway transportation agencies about traffic conditions near the Project site and shall notify each such transportation agency of the approximate date maintenance hole-related work will begin within highways under their respective jurisdictions.

131. Where New York State highway ROW is to be occupied, all work will be performed in accordance with applicable regulations and standards, including 17 *NYCRR* Part 131 covering Accommodations of Utilities within State Highway ROW, the applicable design standards of the American Association of State Highway and Transportation Officials, NYSDOT's Requirements for the Design and Construction of Underground Utility Installations within the State Highway Right-of-Way, Manual of Uniform Traffic Control Devices and New York State Supplement, and the Highway Design Manual. All necessary work permits will be obtained for any work in, on, under, or over State Highway ROW, which includes areas and facilities such as shoulders, guiderails, clear zones, vegetated areas, slopes, and drainage facilities in addition to paved roads. Copies of all required permits will be filed with the Secretary prior to commencement of the work requiring such permits.

132. The Certificate Holder, with respect to all work it performs on the onshore transmission cable, shall coordinate with all appropriate agencies, including the NYSDOT and local highway departments, regarding an MPT Plan that details traffic management of roads under State and municipal jurisdiction. The MPT Plan shall address temporary signage, lane closures, placement of temporary barriers, and traffic diversion and be included as part of the EM&CP.

133. Impacts to LIRR associated with the installation of the onshore transmission cable are anticipated to be minor, temporary, and localized. Equipment delivery and installation stages will be closely coordinated with the LIRR to avoid or minimize conflicts with ongoing railroad operations. Active rail lines will be crossed using trenchless methods, not by open cut trenching. Once installed, the onshore transmission cable will be buried within the railroad ROW and have no effect on railroad operations.

134. Neither the Certificate Holder nor any contractors in its employ shall construct any new or improve any existing access roads not described in the EM&CP except in the case of emergency situations. A notice of any such emergency shall be promptly filed with the Secretary. Access roads do not include public rights of way.

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135. NYSDOT and local highway departments shall have authority to place inspectors on site to monitor and observe the Certificate Holder's activities on State Highways and local roads, or to request the presence of State or local police to ensure the safety of highway travelers, at such times and for such periods as NYSDOT deems appropriate. All costs thereof shall be borne by the Certificate Holder.

136. The Certificate Holder shall comply with the following provisions for snow and ice removal on all roads on which Project construction is occurring.

a.Interference with snow plowing operations by drums, barricades, and other traffic control equipment shall be kept to a minimum. Any devices disturbed or damaged by snow and ice control operations shall be replaced and/or reset as necessary and as soon as possible by the Certificate Holder;

b.Excluding the onshore transmission cable HDD work zone, drainage frames, grates and covers and other castings shall not be adjusted in a travel lane unless the final pavement course is to be placed prior to the onset of snow and ice weather. Steel plates, etc. shall not protrude above the adjacent pavement. If any of these protrusions exist in a non-travel lane prior to a snow and ice condition, then temporary asphalt ramps must be placed so that for every 1 inch of rise, there is a 6-foot run of ramp;

c.All pavement cuts shall be made or maintained to eliminate recessed areas where snow cannot be plowed or where the plows may snag; and

d.Where the work zone traffic control schemes require installation of single or multiple runs of temporary concrete barrier, the Certificate Holder shall remove any snow remaining along the temporary barrier.

M. **Monitoring and Mitigation**

137. The Certificate Holder shall submit, after prior consultation with NYSDPS, NYSDEC, and NYSDOS, Cable Monitoring and Management Plan (SRWEC –NYS Maintenance Plan) as part of the post-Phase 1 EM&CP, which shall include, at a minimum:

a.the method for determining the actual cable location and burial depth of the SRWEC–NYS and the timing for undertaking such efforts, including, for example, the use of distributed temperature sensing technology;

b.a requirement that the Certificate Holder establish depth of burial relative to seabed and the accurate level of the seabed relative to vertical datum during post-construction survey operations. Following this, the Certificate Holder will conduct multibeam echo sounder (MBES) surveys to inspect the HDD exit and export cable in commercial operation in: Year 1, between Years 2 and 3, and between Years 5 and 8. Throughout the operational life of the Project additional MBES surveys will be conducted after 1-in-50 year storm events as will be defined in the EM&CP based on wave height, currents, and/or wind speed, and associated temporal descriptions, and after any cable repair activity. Timing/frequency of inspections following Year 8 and additional to these will be determined through application of a risk-based assessment to ensure required cable burial. This risk-based assessment will be described and detailed further in the EM&CP.

i.The risk-based assessment shall identify a risk to exist if the SRWEC–NYS reaches a burial depth less than 4 ft (1.2 m) (measured from top of cable) below the seabed for greater than 25 ft (7.6 m), in areas where actual burial depth at the time of installation was greater than 4 ft (1.2 m). If this risk is identified, Certificate Holder shall follow the process outlined in Condition 138 (a).

c.a plan for remedying cable exposures within time-of-year restrictions;

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d.a risk-based assessment and plan for remedying exposures outside of time-of-year restrictions that pose a hazard to public safety, navigation, or marine resources, including avoidance and minimization techniques for T&E species;

e.a requirement to take an EMF reading at the Landfall Work Area in the event of a cable exposure;

f.a description of methods to maintain burial depth;

g.a plan for marking the location of any cable exposures; and

h.the design profile of the Landfall Work Area, including anticipated depth along the profile, will be included in the applicable EM&CP. The Certificate Holder shall consult with NYSDEC regarding restoration activities above the HDD installation and comply with applicable State and federal regulatory requirements.

138. The SRWEC–NYS Maintenance Plan shall specify that if the Certificate Holder finds or is alerted that the burial depth poses an unacceptable risk to public safety, navigation, or marine resources, or the integrity of the SRWEC–NYS as per the risk-based assessment, the Certificate Holder shall undertake remedial measures including burial and/or protection measures consistent with the Certificate and approved EM&CP. Before undertaking any such remedial action, the Certificate Holder shall provide a notice to NYSDPS, NYSDOS, and NYSDEC describing its immediate and long-term plan of actions for reducing the risk to acceptable levels while minimizing impacts. The Certificate Holder shall notify mariners, recreational fishermen, and NYSDEC-Licensed Fishermen in accordance with the process set forth in Conditions 61 and Appendix J.

a.The SRWEC–NYS Maintenance Plan shall further specify that, in the event the cable's burial depth is determined to pose a risk as defined in Condition 137 (b) (i), the Certificate Holder will consult with NYSDPS, NYSDEC, and NYSDOS and a determination will be made as to whether the cable poses an unacceptable risk to existing uses or resources per the risk-based assessment and necessitates remedial action consistent with the Certificate and approved EM&CP. Before undertaking any such remedial action, the Certificate Holder shall provide a notice describing its immediate and long-term plan of actions for reducing the risk to acceptable levels while minimizing impacts to NYSDPS, NYSDOS, and NYSDEC. The Certificate Holder shall notify mariners, recreational fishermen, and NYSDEC Licensed Fishermen in accordance with the process set forth in Appendix J.

139. The Certificate Holder shall be responsible for remedying any exposure of the SRWEC–NYS in accordance with the SRWEC–NYS Maintenance Plan. If the Certificate Holder does not begin implementing the SRWEC–NYS Maintenance Plan within 10 days of the date the Certificate Holder is notified of such SRWEC–NYS exposure, or if the Certificate Holder ceases to diligently implement the SRWEC–NYS Maintenance Plan with respect to such exposure to the reasonable satisfaction of the Commission, the appropriate letter of credit identified in Condition 209 may be drawn upon pursuant to the terms of Condition 209. Within 120 days of commercial operation, the Certificate Holder shall submit to NYSDPS, NYSDEC, NYSDOT, NYSDOS, and LICFA as-built drawings and shapefile data providing final elevations of the cable and seabed and actual burial depth of the cable and locations of any cable protection measures; also, drawings will include locations and type of cable protection measures installed along the Project.

140. The Certificate Holder shall include as Appendix N of the Joint Proposal, a Benthic Sampling Plan that provides for one pre-cable installation benthic sampling survey and at least two post-cable installation benthic sampling surveys for the area along the SRWEC–NYS from the proposed HDD exit offshore to the territorial limit of NYS waters (the Benthic Sampling Plan). The Benthic Sampling Plan will specify that:

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a. Pre-construction sampling shall occur between August 1 and October 31, prior to construction, at intervals of 1,000 ft (305 m) along the proposed centerline of the SRWEC–NYS cable corridor from the proposed offshore HDD exit to the territorial limit of NYS waters;

i. The pre-construction survey shall consist of the collection and analysis of at least three replicate paired images from each station collected with a Sediment Profile Imaging/Plan-View Imaging system (SPI/PV) consistent with the techniques utilized in the Application. If feasible in connection with post-Certificate, pre-construction survey efforts, at each SPI/PV station a Conductivity, Temperature, Depth sensor will be used to measure the salinity and temperature through the water column to the sediment surface.

ii. The SPI/PV sampling will be supplemented with three replicate grab samples collected at intervals of 2,000 ft (610 m). A minimum of three replicate grab samples will be analyzed and results will be summarized with metrics.

iii. The variance estimated from these data will be used in a statistical power analysis for the comparison of these metrics between pre- and post-installation time periods. Results of the statistical power analysis and estimation of ecologically meaningful difference will be presented to NYSDEC for review prior to the post-construction sampling surveys.

b. The post-construction benthic sampling shall occur between August 1 and October 31, within 24 months of the Project's COD, in an area extending approximately 100 ft (30 m) on either side of the SRWEC–NYS. The Benthic Sampling Plan shall explain that:

i. During the post-construction benthic sampling, three stations will be sampled with SPI/PV in a transect perpendicular to the SRWEC–NYS at the centerline with one station as close as practicable to the centerline and one station approximately 100 ft (30 m) on either side at 1,000-ft (305-m) intervals from the HDD exit pit offshore to the territorial limit of NYS waters. At each SPI/PV station a Conductivity, Temperature, Depth sensor will be used to measure the salinity and temperature through the water column to the sediment surface. At each station, a minimum of three replicate images shall be collected and analyzed.

ii. The SPI/PV sampling will be supplemented with two grab stations with one station as close as practicable to the centerline and one station approximately 100 ft (30 m) on the eastern side of the cable with three replicate grab samples collected at intervals of 2,000 ft (610 m). One of the replicate grab samples will be tested, and the remaining replicates will be archived. Where analysis indicates that there is an ecologically meaningful difference with preinstallation results, the additional replicates will be analyzed.

iii. Sediment temperature shall be recorded at each SPI/PV station.

141. The Benthic Sampling Plan shall require that results of the pre-cable installation SPI/PV benthic sampling event and of the post-cable installation benthic sampling event shall be submitted to NYSDPS, NYSDOS, NYSAGM, and NYSDEC in a final written report within 6 months of the completion of each sampling event. An additional report shall, as applicable, summarize EMF and thermal impacts during each study period and evaluate the effects on benthic community metrics before and after construction. The results of the benthic community analysis will be provided as a supplement of the report within 9 months of the completion of each sampling event.

142. The Certificate Holder shall include as Appendix O of the Joint Proposal, a Fisheries Monitoring Plan that provides for at minimum 1 year, and a goal of 2 years, of pre-cable installation fisheries studies and at least 2 years of post-cable installation fisheries studies for the area along the SRWEC–NYS. The Fisheries Monitoring Plan shall include an acoustic telemetry study to assess the potential impacts of the SRWEC on the behavior and migratory patterns of

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commercially and ecologically important species in the coastal waters south of Long Island. A draft Fisheries Monitoring Plan has been developed and presented to state and federal resource agencies and fishing industry stakeholders for review and comment.

143. The Fisheries Monitoring Plan will include the use of acoustic transmitters on lobsters, horseshoe crabs, winter skates, smooth dogfish, sandbar sharks, dusty sharks, and sand tiger sharks, and the deployment of an array of acoustic receivers in the nearshore area of the SRWEC–NYS, to evaluate the effects of EMF on behavior and movement of targeted species before, during, and after construction.

144. The Certificate Holder shall provide funding for 5 study years and shall use best efforts to collect 2 years of pre-construction data, 1 year of data during construction, and 2 years of data following commercial operation of the SRWEC–NYS.

145. Annual reports will be prepared after the conclusion of each year of telemetry monitoring and will be made available in accordance with Section 12.07 of the Offshore Wind Renewable Energy Certificate (OREC) Agreement. Following conclusion of the monitoring study, one final report will also be produced synthesizing the findings of the pre- and post- construction evaluations. The Certificate Holder shall file a notice with the Secretary when the consolidated report is available.

146. The Certificate Holder shall make publicly available survey data collected during the completion of the Benthic Sampling Plan and Fisheries Monitoring Plan in shapefile and PDF format. The Post-Construction EMF Report (Condition 22) and the EMF Verification Assessment (Conditions 23 and 24) will be made public.

147. The Certificate Holder has and will continue to participate in the technical working groups convened by New York State Energy Research and Development Authority (NYSERDA) and related to offshore wind development, and through such technical working groups, engage the relevant stakeholder groups regarding the Project (in accordance with Section 12.04 of their OREC Agreement with NYSERDA). Environmental data will be made available in accordance with Section 12.07 of the OREC Agreement.

N. **Onshore Erosion Control and Soil Handling**

148. Prior to start of construction, the Certificate Holder shall install erosion and sediment control practices as indicated in any applicable EM&CP and any stormwater and erosion control plans. Installed erosion and sediment control practices shall be inspected daily and promptly repaired, where necessary in areas of active construction. In areas without active construction, where temporary stabilization measures have been applied to all disturbed areas, erosion and sediment control practices shall be inspected weekly and promptly repaired, where necessary, if permanent stabilization has not been achieved. All erosion and sediment control practices shall be designed and installed per the "New York State Standards and Specifications for Erosion and Sediment Control" and shall be inspected and maintained in accordance with the requirements of the SPDES General Permit currently in effect.

149. To the extent available, all erosion control fabric or netting used for slope or soil stabilization will be 100% biodegradable natural product (not photodegradable fabric), excluding geotextiles used for road construction and temporary erosion control devices such as silt fence and silt sock.

150. In all portions of the onshore Project Corridor where these measures may prove beneficial, topsoil shall be removed from the combined width of the subsoil stockpile area, trench, construction assembly and traffic zones. The depth of the topsoil removal shall include all of the "A" horizon down to the beginning of the subsoil "B" horizon, generally not to exceed a maximum of 12 inches. All topsoil shall be stockpiled separate from other excavated

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materials. The exposed surface of the subsoil shall be the work surface. All topsoil material shall be stripped, stockpiled, and returned in its natural sequence to restore the original soil profile. During the clearing/construction phase, site-specific depths of topsoil stripping shall be monitored by Certificate Holder. Where ROW construction includes cut-and-fill of the soil profile across grades, all topsoil shall be stripped and separately stockpiled, where practical, on the upslope edge of the ROW.

151. The Certificate Holder shall comply with the following debris and fill requirements:

a. Any debris or excess construction materials shall be removed to a facility duly authorized to receive such material. No burying or burning of construction debris or excess construction materials will be allowed.

b. Except where required to comply with the design specifications, to restore roadway and shoulder surfaces, and to reuse uncontaminated excavated materials, all fill shall consist of clean soil, sand and/or gravel that is free of the following substances: asphalt, slag, broken concrete, demolition debris, garbage, household refuse, tires, woody materials including tree or landscape debris, and metal objects. Best efforts will be made use fill materials that are visually free of invasive species.

152. The Certificate Holder shall prepare a Geotechnical Site Investigation Report, to be included in the Phase 1 EM&CP, verifying subsurface conditions along the approved onshore transmission cable corridor and characterizing subsurface conditions at sites where HDD is proposed.

O. **Water Resources**

153. Jurisdictional waterbodies and wetlands will be referred to herein as "wetlands and waterbodies" and the "appropriate adjacent areas" shall mean (i) the 100-foot adjacent area associated with State jurisdictional Article 24 Freshwater Wetlands, and (ii) the 300-foot (or less due to the presence of a qualifying structure[s] as defined by 6 *NYCRR* Part 66) adjacent area associated with State jurisdictional Article 25 Tidal Wetlands. When the terms are used together, they will be listed as "wetlands and waterbodies and/or appropriate adjacent areas."

a. Certificate Holder shall follow Appendix S to the Joint Proposal, Wetlands and Waterbodies Specifications.

154. Except as otherwise permitted in the Certificate or EM&CP, no construction activities shall occur within any wetlands and waterbodies, historic / extant / existing submerged aquatic vegetation beds, any Natural Protective Feature, and ponds or pools associated with the Carmans River watershed, and no construction materials, equipment, or vehicles shall be allowed to enter upon such wetlands and waterbodies and appropriate adjacent areas.

155. The Certificate Holder shall perform a pre-construction survey to determine the presence or absence of extant/existing SAV beds within the Project Corridor in the ICW and the footprint of the Equipment (see Condition 81). The plan and timing of this survey will be outlined in the Submerged Aquatic Vegetation Survey Plan, which shall be filed as part of the post-Phase 1 EM&CP. The Certificate Holder shall provide the survey plan at least 45 days prior to filing the EM&CP to NYSDPS, NYSDOS, NYSDEC, and NYSAGM for review and comment. If extant/existing submerged aquatic vegetation beds are found during the survey or were found during the 2020 extant/existing SAV survey performed within the Project Corridor along the ICW HDD's route, that could be impacted by an HDD inadvertent return or use of the Equipment, the Certificate Holder shall develop a Submerged Aquatic Vegetation Monitoring and Minimization Plan that will be reviewed and agreed to with NYSDPS, NYSDOS, and NYSDEC. Such plan will be filed with the Secretary prior to the installation of the Equipment. If it is determined in consultation with NYSDEC and NYSDOS that extant/existing SAV will be taken during construction, the Certificate

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Holder will implement a SAV Restoration Plan that will outline restoration of 3:1 for direct take and 1:1 for indirect impact. The SAV Restoration Plan, if necessary, shall be filed with the Secretary prior to the Commencement of Construction in the relevant area.

156. As will be detailed in the EM&CP, the Certificate Holder will first avoid and then minimize to the maximum extent practicable impacts to the Coastal Erosion Hazard Area (CEHA) regulated under ECL Article 34 and associated regulations in 6 *NYCRR* § 505. Unless otherwise authorized by the EM&CP, the HDD entry and exit will not be located within the CEHA.

157. As will be detailed in the EM&CP, the Certificate Holder will list the activities and anticipated timeframes proposed within each Significant Coastal Fish and Wildlife Habitat (SCFWH) and identify avoidance and minimization measures for the following:

a. significant concentrations of waterfowl during spring or fall migration and overwintering associated with the following SCFWHs: Great South Bay-East, Moriches Bay; and

b. overwintering and active nesting sites for raptors (e.g., peregrine falcon, northern harrier, osprey, Cooper's hawk) and nesting shorebirds associated with the following SCFWHs: Carmans River, Great South Bay-East, Moriches Bay, and Smith Point County Park.

158. The Certificate Holder shall perform all construction, operation, and maintenance along the onshore transmission cable in a manner that first avoids and then minimizes, to the maximum extent practicable, adverse impacts to wetlands and waterbodies and appropriate adjacent areas. If wetlands and waterbodies cannot be fully avoided, any such activities shall be performed in accordance with a Wetland Impact Minimization and Mitigation Plan to be included in any applicable EM&CP. Forty-five (45) days prior to filing the EM&CP, the Certificate Holder shall submit the Wetland Impact Minimization and Mitigation Plan to NYSDPS, NYSDEC, and NYSDOS for review and comment.

159. Unless otherwise approved in the Certificate or EM&CP, the onshore transmission cable shall be installed using trenchless methods when traversing all wetland and waterbodies.

160. The Certificate Holder shall notify NYSDPS and NYSDEC via telephone within two hours if there is a discharge to a wetland or waterbody resulting in a violation of NYS Water Quality Standards. A written description provided via email of the discharge, photographs, and a summary of remedial activities, shall be provided to NYSDPS and NYSDEC within 24 hours of such discharge.

161. The Certificate Holder shall take all necessary precautions to preclude contamination of any wetland or waterbody by suspended solids, sediments, fuels, solvents, lubricants, epoxy coatings, paints, concrete, leachate, washings from transit mix trucks, mixers, or other devices or any other environmentally deleterious materials associated with the Project. If required, concrete batch plant operations and concrete washout areas shall be located a minimum of 300 ft (91 m) away from any wetland or waterbody.

a. If concrete batch plant operation(s) are required, the location(s), site plans and appropriate measures for avoiding adverse impacts, restoring sites upon Project completion, and complying with local code requirements will be included in the EM&CP.

162. The Certificate Holder shall secure and safely contain all equipment and machinery outside of wetlands and waterbodies, at the end of each workday, unless moving the equipment will cause additional environmental impact.

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163. Fueling of equipment and storage of fuel or other chemicals is strictly prohibited within tidal wetlands and within 100 ft (30 m) of the tidal wetland boundary. Fueling and storage areas within 300 ft (90 m) of any tidal wetland and/or within the New York State Coastal Area as defined within NYS Executive Law § 911(1) and (2) must be delineated in the EM&CP and contained by strawbales or other approved containment devices (i.e., containing at least 110% of the volume stored) to prevent spills from entering tidal wetlands and/or waterways. Should a spill occur, the Permittee shall immediately notify the Regional Marine Habitat Protection Office at 631- 444-0295, the NYSDEC Spill Hotline at 800-457-7362, and shall provide a plan for containment, clean-up and restoration of the impacted area for the approval of the department. No refueling is authorized on the beach.

a. Dewatering pumps operated within the adjacent areas as defined in Condition 68, must be within secondary containment large enough to hold the pump and accommodate refueling.

164. The Certificate Holder shall comply with the following conditions for all dewatering operations:

a. dewatering operations shall discharge into a dewatering device delineated in the Certificate Holder's Dewatering Plan (i.e., temporary straw bale/silt fence barrier, filter bag, frac tanks or similar containers);

b. water generated from groundwater dewatering operations that exceeds NYSDEC standards, criteria, or guidance values, or more stringent applicable levels of other authorities or agencies in effect at the time of dewatering operations must be treated

and/or disposed of in compliance with the approved Dewatering Plan;

c. one round of groundwater baseline sampling will occur prior to the start of construction at locations where excavations are anticipated to extend below the groundwater table (such as at trenchless crossings locations) to identify potential groundwater contamination that may require testing, treatment, or disposal during construction. The testing, treatment, and/or disposal practices, as necessary, will be addressed in the Certificate Holder's Dewatering Plan;

d. best management practices shall be used to prevent erosion and sedimentation from discharge operations; and

e. water resulting from dewatering operations, equipment washing, or other construction related activities shall not be directly discharged

165. All sampling, disposal, and construction activities must be performed in a manner consistent with NYSDEC standards, criteria, or guidance in effect at the time of such activities. into any wetland or waterbody.

166. The Certificate Holder shall inform the USACE and NYSDOS of any changes in the design of the Project that have the potential to impact any USACE-issued permit or authorization and shall file a copy of such correspondence with the Secretary.

167. If there are impacts to freshwater wetlands or associated wetland adjacent areas, those areas shall be stabilized within 48 hours of final backfilling of the trench and restored to pre-construction contours as soon as practicable, but no later than 14 days of final backfilling. Immediately upon completion of grading, and as consistent with existing land uses, the area shall be seeded with a seed mix of native plants specified in the approved EM&CP that is appropriate for wetlands and upland areas adjacent to wetlands. Overall vegetative cover in restored areas shall be monitored for a minimum of 5 years or until an 80% cover of plants with the appropriate wetland or upland plants (as appropriate) has been reestablished over all portions of the restored area. Invasive species growth in the restored areas shall be monitored for a minimum of 5 years. The proportion of invasive species in the freshwater wetlands

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and adjacent areas cannot exceed the proportion that existed immediately prior to the start of construction as described in the baseline invasive species survey. If, after one complete growing season, the 80% cover requirement has not been established or the proportion of invasive species has increased, the Certificate Holder shall consult with NYSDEC and prepare a Wetland Planting Remedial Plan (WPRP) in accordance with the approved EM&CP and shall submit the WPRP to NYSDEC and NYSDPS for acceptance prior to implementation.

P. **Cultural Resources**

168. The Certificate Holder shall implement the following cultural resources avoidance, minimization, and mitigation measures, as determined in consultation with the OPRHP:

a. The Certificate Holder shall not undertake construction in previously undisturbed areas where archaeological surveys have not been completed until such time as the appropriate authorities, including OPRHP, and NYSDPS, have reviewed the results of any historic properties and archaeological surveys that are required.

b. The Certificate Holder shall indicate in any applicable EM&CP or equivalent documents, measures for avoidance of archaeological sites identified within the Project Corridor, if applicable. The mapped locations of all identified archaeological sites within the Project Corridor shall be identified as "Environmentally Sensitive Areas" or similar on the final construction drawings and onshore (terrestrial) archaeological sites will be marked in the field to restrict access.

c. A Final Cultural Resources Mitigation Plan, as applicable, either as adopted by a federal permitting agency in subsequent National Historic Preservation Act (NHPA) §106 or National Environmental Policy Act (NEPA) substitution for §106 review, or as revised in further consultation with New York SHPO in the event that the NHPA §106 or NEPA substitution for §106 review does not require that the mitigation plan be implemented, or as further supplemented pending any negotiations among parties. Proof of mitigation funding awards for offsetting Project implementation impacts to significant cultural resources to be provided within 2 years of the start of construction of the facility shall be included.

169. The following conditions apply to the discovery of unanticipated archaeological materials:

a. If unanticipated archaeological discoveries occur during onshore construction, and continuing construction in the immediate vicinity (150 ft or 45 m) would be incompatible with the objective of preserving the quality and integrity of the resource, the Certificate Holder shall stabilize the area and cease all ground-disturbing activities in the immediate vicinity (150 ft or 45 m) of the find and protect the find from further damage. The restricted areas would extend from the maximum discernable limit of the archaeological resource. The only earth-moving activities that may occur within the restricted areas prior to notifications are those necessary for immediate stabilization of the exposed archaeological feature or deposit. The Certificate Holder shall flag, fence off, or securely cover with steel plates the archaeological discovery location and take reasonable measures to ensure site security.

b. If unanticipated archaeological discoveries occur during offshore construction, the Certificate Holder shall stop work in the immediate vicinity (within 150 ft or 45 m) of the find and consult a qualified marine archaeologist to assist in determining the origin of any finds and immediate measures, if appropriate and feasible, to stabilize the archaeological resource. The avoidance distance would extend from the maximum discernible extent of the archaeological resource.

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c. Within 24 hours of such onshore or offshore discovery, the Certificate Holder shall notify and consult with NYSDPS and OPRHP to determine the best course of action. Any discovery made on a weekend will be protected until NYSDPS and OPRHP are notified of the discovery. No construction activities shall be permitted in the vicinity of the find until such time as the significance of the resource has been evaluated by OPRHP and the need for and scope of impact mitigation has been determined by NYSDPS in consultation with OPRHP and the Certificate Holder. The Certificate Holder may engage qualified archaeologists to assist in preliminary visual assessments and documentation, consultations with OPRHP and NYSDPS, and development of appropriate treatment/mitigation measures.

170. Should human remains or evidence of human burials be encountered during the conduct of archaeological data recovery fieldwork or during construction, all work in the vicinity of the find shall be halted immediately for the remains to be protected from further disturbance. Immediately upon any such discovery, the Certificate Holder shall notify and consult with NYSDPS and OPRHP. The Certificate Holder shall ensure that treatment of human remains is done in accordance with the OPRHP's Human Remains Discovery Protocol (dated August 2018).

171. The Certificate Holder shall ensure that all archaeological or human remains-related encounters and their handling are reported in the status reports summarizing construction activities.

Q. Terrestrial and Wildlife Resources

172. The Certificate Holder shall refer to 6 *NYCRR* Part 182 and http://www.dec.ny.gov/animals/7494.html for lists of T&E animal species and to 6 *NYCRR* Part 193 for T&E plant species. Prior to the Commencement of Construction of the onshore transmission cable, the Certificate Holder will provide all workers with pertinent information on potential T&E species in the Project Corridor.

173. If any T&E animal or plant species are observed from the Project Corridor, access roads, laydown yards, and any other areas where Project activities authorized in this Certificate are conducted, the Certificate Holder shall immediately notify the environmental monitor to determine the appropriate actions, if any, to protect the identified species, or its occupied habitat, from immediate harm, and shall also notify NYSDPS and NYSDEC within 24 hours.

174. If any work results in or is likely to result in an incidental take of an Endangered or Threatened species as defined in 6 *NYCRR* Part 182, the Certificate Holder must stop work where the take occurred or is likely to occur (Stop Work Area) and must submit an Endangered or Threatened Species Mitigation Plan and Implementation Agreement (T&E Plan/Agreement) demonstrating proposed mitigation measures that will result in a Net Conservation Benefit to that species. Such T&E Plan/Agreement must be prepared in accordance with the requirements of 6 *NYCRR* Part 182, and developed in consultation with and accepted by NYSDEC and NYSDPS. Work must not recommence in the Stop Work Area until the T&E Plan/Agreement is accepted by NYSDEC and such T&E Plan/Agreement is implemented.

175. Certificate Holder will develop and include as part of the Phase 1 EM&CP an Avian Management Plan for rare, threatened, and endangered ("RTE") avian species in consultation with the appropriate regulatory agencies, including the NYSDEC, to address residual risk to these species.

R. Invasive Species

176. The Certificate Holder shall prepare an Invasive Species Control and Management Plan in accordance with the applicable requirements of ECL Article 9 and 6 *NYCRR* Part 575 and 6 *NYCRR* Part 663 as outlined in the Invasive Species Management Plan Specifications in Appendix P of the Joint Proposal. Forty-

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five (45) days prior to filing the Phase 1 EM&CP, the Certificate Holder shall submit the Invasive Species Control and Management Plan for NYSDPS review and comment in consultation with NYSDEC. The Certificate Holder shall file said Invasive Species Control and Management Plan as part of the EM&CP.

177. To minimize the risk of introducing invasive species, use of hay is strictly prohibited.

S. **Marine Resources**

178. The Certificate Holder must comply with applicable federal agencies' requirements for noise mitigation for protected species in NYS waters as required in the federal COP approval, USACE permits, and Incidental Take Authorization (ITA) issued for this Project.

179. The Certificate Holder must comply with applicable federal agencies' requirements for protected species mitigation, monitoring and reporting as detailed in the federal COP approval, ITA, and other federal permits/approvals issued for this Project. All protected species reports submitted to United States Bureau of Energy Management (BOEM) and NOAA involving NYS waters will be copied to NYSDEC.

180. Sightings of North Atlantic Right whales must be reported to NOAA within 24 hours.

T. **Water Quality**

181. Water quality standards set forth in 6 *NYCRR* Parts 701, 702, 703 and 704, and sections 301, 302, 303, 306, and 307 of the federal Clean Water Act (see 33 USC §§ 1311, 1312, 1313, 1313a, and 1317) shall not be contravened. Issuance of a Water Quality Certification also implies compliance with standards assuming that conditions placed in the certification are complied with.

a. Water Quality Standard: None from sewage, industrial waste or other wastes that will cause deposition or impair the waters for their best usages.

182. The Certificate Holder shall incorporate within the post-Phase 1 EM&CP and implement a Suspended Sediment and Water Quality Monitoring Plan pertaining to offshore and onshore activities. The Certificate Holder must submit a Suspended Sediment and Water Quality Monitoring Plan for review and comment by NYSDPS, NYSDEC, and NYSDOS 45 days prior to the filing of the EM&CP. The Suspended Sediment and Water Quality Monitoring Plan must be prepared in accordance with Appendix I of the Joint Proposal.

a. Water quality monitoring shall be conducted within the Project Corridor as described in Appendix B during seabed preparations, jet trenching pre-construction and construction activities, excavation of the HDD exit, pre-lay grapnel run, cable installation, backfill of the HDD exit, and maintenance and decommissioning activities that involve disturbance of sediments (together, "Monitored Construction Activities").

b. Maintenance and decommissioning activities that result in only minor disturbance of sediments, including: (i) anchor sweep; (ii) anchoring; (iii) placement of jack-up barge; (iv) hand jetting; or (vi) other activities as determined by NYSDPS, in consultation with NYSDEC, shall not require water quality monitoring.

183. The Suspended Sediment and Water Quality Monitoring Plan must:

a. Specify sample location, depth of samples, frequency of sampling, and sampling during various tidal cycles;

b. Describe procedures for background (up-current) and compliance (down-current) monitoring;

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c. Include daily sampling during each tidal cycle;

d. Use an Acoustic Doppler Current Profiler to locate the plume;

e. Require whole water samples in the vertical water column (from at least three depths) along a transect within the plume;

f. Include an up-current transect outside the influence of Monitored Construction Activities;

g. Require water quality monitoring, which shall include laboratory total suspended solids (TSS) and optical backscatter (OBS) turbidity analyses, to be conducted daily throughout the duration of Monitored Construction Activities. Prior to commencing maintenance and decommissioning activities, the Certificate Holder shall submit for NYSDEC review a water quality monitoring plan for activities that may require such monitoring;

h. Identify a procedure whereby, if sampling results indicate consistent compliance with the TSS standards, the Certificate Holder can submit a request in writing to NYSDPS and NYSDEC to reduce the sampling frequency;

i. Specify that real-time data must be collected using Acoustic Doppler Current Profiler and OBS sensor instrumentation and by collecting water samples at various depths for laboratory analysis of: TSS according to the methods and method detection limits identified in the Water Quality Monitoring Plan;

j. Specify that, if activities occur concurrently in multiple locations, each activity that may cause resuspension of bottom sediments must be monitored separately.

184. All water quality analyses required by this Certificate must be conducted by a laboratory certified by the NYSDOH ELAP.

185. Certificate Holder shall use commercially reasonable efforts to request the most expedited turnaround time available for laboratory samples for locations along the SRWEC–NYS. Analytical results must be sent to NYSDPS and NYSDEC as soon as received from the laboratory, but no longer than forty-eight (48) hours of receipt. Exceedances must be highlighted.

186. A pre-activity water quality calibration will be conducted to ensure that TSS may be accurately estimated in real-time during water quality monitoring activities. The pre-activity water quality calibration will be described in detail in the suspended solids and water quality monitoring plan.

187. The following limit must be achieved for TSS at a distance of 1,500 ft (457 m) down current (based on tide direction) of sediment disturbing activities:

a. Guidance Value: TSS 100 mg/L above ambient for all offshore construction activities.

b. If during water quality monitoring, the real-time TSS concentrations established by the calibration curve exceed the TSS limits established in this Certificate, NYSDPS, NYSDEC Staff, and the Aquatic Environmental Monitor shall be immediately notified and work shall be ceased immediately and then restarted at modified levels that will reduce TSS levels and bring them into compliance with Condition 192 (a) (b) in accordance with iterative changes outlined in Condition 192 (c) (ii) and (iii). The Certificate Holder will continue to iteratively implement operational controls and measure the resulting TSS. The Certificate Holder will notify the Aquatic Monitor throughout the process about any such operational adjustments.

i. During implementation of corrective actions, NYSDPS and NYSDEC may specify additional monitoring until compliance with Water Quality Standards is demonstrated. Samples shall be collected until resumption of routine monitoring is authorized by NYSDPS in consultation with NYSDEC.

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ii. For purposes of iterative changes to the use of a controlled flow excavation (CFE) or hand jetting tools, the following changes may be employed: changing the rate of advancement of the CFE or hand jet tool, modifying or varying hydraulic jetting pressures, and/or implementing other reasonable operational controls that may reduce suspension of in-situ sediments in a manner that would not materially delay the progress of work to complete the installation procedure.

iii. For purposes of iterative changes to the use of a barge mounted excavator, the following changes may be employed: changing the rate of advancement of the excavator, modifying the depth of the excavator bucket in the water column, implementing other reasonable operational controls that may reduce suspension of in-situ sediments in a manner that would not materially delay the progress of work to complete the installation procedure, and/or operating the bucket so as to control the rate of the descent and to maximize the depth of penetration without overfilling the bucket, and/or to control bucket retrieval rates.

188. If any jet trenching technology is used to lay the cable, trials must be conducted within representative sections or areas proximate to the proposed underwater cable route in NYS waters prior to cable installation to ensure compliance with TSS threshold limits as defined in Condition 187 (a). The trial will include approximately 1,000 ft (305 m) of jet trenching operations within an area to be specified in the Jet Trencher Trial Plan that will be submitted as part of the post-Phase 1 EM&CP. The following conditions apply to jet trencher trials:

a. Pre-monitoring water quality calibration will be conducted prior to the jet trencher trails and will enable real-time estimation of TSS concentrations during the trials.

b. A combination of acoustic ("ADCP") and calibrated OBS measurements will be used to estimate TSS concentrations on selected transects. TSS and OBS turbidity water samples will be collected 1,500 ft (457 m) up-current (for baseline) and 1,500 ft (457 m) down-current of the jet plow, at three-interval depths (near surface, mid-depth, and near bottom) and analyzed by a NYSDOH Environmental Laboratory Approval Program ("ELAP") certified laboratory. Water quality monitoring requirements during jet trencher trials will be described in detail in the suspended solids and water quality monitoring plan;

c. The Certificate Holder must coordinate with NYSDPS and NYSDEC to share real-time TSS measurement estimates collected during the jet trencher installation trials to evaluate whether the operating conditions result in TSS concentrations that exceed the TSS threshold limit;

d. If the jet trencher trials demonstrate that the operating conditions result in TSS concentrations that exceed the TSS threshold limit established herein, the Certificate Holder notify NYSDPS and NYSDEC and implement feasible modifications to the jet trencher operating conditions to further reduce in-situ sediment resuspension associated with the jet trencher installation procedure; and

e. Jet trencher operations may proceed after Jet Trencher Trial results are reviewed in real-time and accepted by NYSDPS and NYSDEC. Review of this information by NYSDPS and NYSDEC staffs shall not unreasonably delay the commencement of installation of the underwater cable system.

189. The following conditions apply if jet trenching technology is used to install the SRWEC–NYS:

a. The Certificate Holder must operate the jet trencher in accordance with the operating conditions determined through jet trencher trials to maintain the suspension of in-situ sediments within the Total Suspended Solid (TSS) limits;

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b. If, during jet trencher installation of the cable, TSS concentrations exceed the TSS limits established in this Certificate, the Certificate Holder shall follow the process established in Conditions 188 and 189 (c).

c. For purposes of iterative changes to the use of the jet trencher, the following changes may be employed: changing the rate of advancement of the jet trencher, modifying or varying hydraulic jetting pressures, and/or implementing other reasonable operational controls that may reduce suspension of in-situ sediments in a manner that would not materially delay the progress of work to complete the jet trencher installation procedure.

190. The offshore conduit end of the SRWEC–NYS may be exposed or buried by means of hydraulic or mechanical dredging. Material needed for cover of the Landfall HDD conduit end will be placed adjacent to the Landfall HDD conduit location for later use as cover material. Material placement will be done to minimize the footprint of the reverse backfill material and the Certificate Holder will minimize the sediment removed from the offshore HDD exit to the maximum extent practicable. If material to be dredged is contaminated, prior to dredging, the Certificate Holder shall identify the final dredged material disposal location, including a letter from the permitted disposal facility verifying that they will accept the material.

a. All contaminated material shall be handled in accordance with details provided in the EM&CP and below:

i. only use equipment in good operating condition;

ii. not use deck barges, unless modified to allow no barge overflow and as approved by the environmental monitor and NYSDPS in consultation with NYSDEC;

iii. use barges or scows of solid hull construction or which are sealed;

iv. use a closed (i.e., sealed) environmental (e.g., clamshell) bucket with sealing gaskets or an overlapping sealed design at the jaws and seals or flaps positioned at locations of vent openings to minimize sediment suspension;

v. ensure that seals or flaps designed or installed at the jaws and locations of vent openings tightly cover these openings while the bucket is lifted through the water column and into the barge;

vi. equip the closed environmental (e.g., clamshell) bucket with sensors to ensure complete closure of the bucket before lifting through the water;

vii. operate the bucket so as to control the rate of the descent and to maximize the depth of penetration without overfilling the bucket;

viii. control bucket retrieval rates to minimize turbidity;

ix. lower the bucket to the level of the barge gunwales prior to release of the load and place the excavated material deliberately and in a controlled manner;

x. suspend operations until any necessary repairs or replacements are made when a significant loss of water and visible sediments from the bucket is observed;

xi. avoid washing the gunwales of the scow except to the extent necessary to ensure the safety of workers;

xii. not overflow the barge; and

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xiii. The Certificate Holder shall allow a minimum twenty-four (24) hours of settlement prior to decanting barges. Decanting of barges may not commence until approved by NYSDPS, in consultation with NYSDEC;

xiv. operate the equipment so as to minimize sediment transport.

191. The Certificate Holder will perform a focused benthic study designed to investigate benthic recovery following completion of construction at the offshore HDD exit. The scope of that study is outlined in Appendix Q.

192. The following conditions shall be applied to minimize sediment released into the water column during the Landfall HDD conduit installation:

a. The environmental monitor shall inspect all installation equipment to be utilized at the offshore HDD exit prior to use and shall perform periodic inspections of all such equipment no less than once per week when in use.

b. The Certificate Holder shall:

i. only use equipment in good operating condition;

ii. only use equipment fit for purpose;

iii. operate the equipment to satisfy TSS guidance value described in Condition 187;

iv. not use a dragline for excavation;

v. demonstrate to the environmental monitor that the equipment operator has sufficient control over the bucket operation so that the sediment resuspension from bucket contact with the bottom and bucket overfilling is minimized;

vi. utilize bucket excavation unless bucket excavation would endanger the HDD borehole, in which case the Certificate Holder may use airlift, CFE, and/or suction dredging methodologies to install the HDD conduit and the SRWEC–NYS cable; and

vii. during excavation and backfill of at the offshore HDD exit pit, provide to NYSDPS, NYSDEC, NYSDOS weekly progress reports that demonstrate compliance with Certificate requirements and such other information as determined necessary based on consultation with NYSDPS, NYSDEC, and NYSDOS.

c. Certificate Holder may install permanent concrete mattresses or rock bags for protection of the conduit and/or cable within the offshore HDD exit, provided that the Certificate Holder shall cover such protection measures with at least 3 ft (1 m) of material excavated from the HDD exit or similar material from upland sources and ensure that there is no discernible depression consistent with Condition 192 (d). Additional details regarding such cable protection measures shall be provided in the EM&CP. Prior to filing the post-Phase 1 EM&CP, Certificate Holder shall consult with NYSDPS, NYSDEC, and NYSDOS regarding cable protection measures.

d. No later than 3 months following the COD, exclusive of the construction windows described herein, Certificate Holder shall determine whether there is a discernible depression at the offshore HDD exit. If there is a discernable depression, the Certificate Holder will timely backfill the HDD exit unless, in consultation with NYSDPS and NYSDEC, it is determined backfill is not necessary.

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193. Visual observations of turbidity will be identified in the post-Phase 1 EM&CP caused by underwater cable and HDD exit pit installation/backfill activities, pre-lay grapnel run operations, maintenance, and decommissioning activities must be conducted to ensure compliance with the narrative water quality standard in 6 *NYCRR* § 703.2: "No increase that will cause a substantial visible contrast to natural conditions."

194. If an HDD exit pit is utilized, within 4 months of commercial operation, the Certificate Holder must submit a report summarizing the results of the construction of the offshore HDD exit, water quality monitoring, and excavated material management operations. The report shall include:

a. location and extent of excavation;

b. total amount of material excavated;

c. ultimate placement location of excavated material;

d. water quality monitoring results and corrective actions (when needed) taken; and

e. documentation of follow-up testing/observations.

195. Within 4 months of completion of the excavation of the offshore HDD exit, the Certificate Holder must file with the Secretary an analysis comparing the actual water quality monitoring results obtained during installation with any model predictions previously provided in support of the Project.

196. Certificate Holder shall comply with any conditions contained in a Water Quality Certification issued pursuant to Section 401 of the federal Clean Water Act, a draft of which is set forth in Appendix F.

U. **Handling of Petroleum & Hazardous Substances**

197. Uncontaminated drill cuttings and drilling muds from drilling processes which utilize only air, water, or water-based drilling fluids are considered construction and demolition debris under 6 *NYCRR* Part 360 (Solid Waste) and can be disposed of at either construction and demolition debris landfills or at municipal solid waste (MSW) landfills. Drill cuttings from drilling processes which utilize polymer-based mud containing mineral oil lubricant are considered contaminated and can only be disposed of at MSW landfills. Dewatered drilling muds including polymer-based mud containing mineral oil lubricant can only be disposed of at MSW landfills.

198. Chemicals and petroleum products will not be stored, mixed, or loaded, nor will equipment be refueled, within 300 ft (90 m) of wetlands and waterbodies and/or within the New York State Coastal Area as defined within NYS Executive Law § 911 (1) and (2), unless otherwise authorized by any EM&CP. Requirements for refueling within 100 ft (30 m) of wetlands and waterbodies will be allowed in the circumstances outlined below or as otherwise authorized by the EM&CP.

a. Refueling of hand equipment will be allowed within 100 ft (30 m) of wetlands or waterbodies when secondary containment is used. Secondary containment will be constructed of an impervious material capable of holding the hand equipment to be refueled and at least 110 percent of the fuel storage container capacity. Fuel tanks of handheld equipment will be initially filled in an upland location greater than 100 ft (30 m) from wetlands or waterbodies in order to minimize the amount of refueling within these sensitive areas. Crews will have sufficient spill containment equipment on hand at the secondary containment location to provide prompt control and clean-up in the event of a release. If a dewatering pump is operated closer than

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100 ft (30 m) from the wetlands or waterbody, or within 300 ft (90 m) from tidal wetlands, it must be within secondary containment large enough to hold the pump and accommodate refueling.

b. Refueling of equipment will be allowed within 100 ft (30 m) of wetlands or waterbodies when necessary to maintain continuous operations and where removing equipment from a sensitive area for refueling would increase adverse impacts to the sensitive area. Fuel tanks of such equipment will be initially filled in an upland location greater than 100 ft (30 m) from wetlands or waterbodies in order to minimize the amount of refueling within these sensitive areas. All refueling of equipment within 100 ft (30 m) of wetlands or waterbodies will be conducted under the direct supervision of the environmental monitor. Absorbent pads or portable basins will be deployed under the refueling operation. In addition, the fuel nozzle will be wrapped in an absorbent pad and the nozzle will be placed in a secondary containment vessel (e.g., bucket) when moving the nozzle from the fuel truck to the equipment to be refueled. All equipment operating within 100 ft (30 m) of a wetland or waterbody will have sufficient spill containment equipment on board to provide prompt control and clean-up in the event of a release.

199. The Certificate Holder shall comply with the following spill requirements:

a. A Spill Prevention, Control, and Countermeasure (SPCC) Plan to minimize the potential for unintended releases of petroleum and other hazardous chemicals during Project construction and operation shall be included in each applicable EM&CP;

b. All non-passenger vehicles must be equipped with spill kits containing a variety of sorbents for small to large releases. Spill kits will be on hand during all refueling operations. Any leaks will be stopped and cleaned up immediately;

c. Spillage of fuels, waste oils, other petroleum products or hazardous materials shall be reported to NYSDEC's Spill Hotline (1-800-457-7362) within 2 hours, in accordance with the NYSDEC Spill Reporting and Initial Notification Requirements Technical Field Guidance (http://www.dec.ny.gov/docs/remediation_hudson_pdf/1x1.pdf); and

d. The Certificate Holder shall report all spills encountered, regardless of whether it is the spiller, to both the NYSDEC Spill Hotline and NYSDPS, in accordance with all federal and State regulations, and provide a copy of such notification contemporaneously to the affected property owner. The Certificate Holder acknowledges that neither the Town nor NYSDOT will undertake or accept financial responsibility for any remediation or similar activity with respect to the removal of hazardous wastes (6 *NYCRR* Parts 373 and 374) and non-hazardous solid industrial wastes (6 *NYCRR* Part 360) for any such spills caused by Certificate Holder or its contractors.

V. **Vegetation Management and Herbicide, Fungicide, and Pesticide Use**

200. The Certificate Holder shall prepare a Vegetation Management Plan as part of the Phase 1 EM&CP. Forty-five (45) days prior to filing the EM&CP, the Certificate Holder shall submit the Vegetation Management Plan to NYSDPS and NYSDEC for review and comment.

201. The Certificate Holder shall take appropriate measures, as outlined in the Vegetation Management Plan to minimize tree clearing, install tree protection fencing around critical root zone, and minimize soil compaction within temporary work areas that will be revegetated post-construction, including but not limited to work areas within SCFWHs, open space, parkland, and wetlands and waterbodies.

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202. Certificate Holder shall only use the pesticides, fungicides, and herbicides specified in the EM&CP. If the Certificate Holder desires a change to the pesticides, herbicides, and fungicides specified in the EM&CP, including mix proportions, additives (with the exception of dyes), or method of application, the Certificate Holder shall submit the proposed change for approval pursuant to Condition 41. The Certificate Holder will not use pesticides, fungicides, or herbicides in wetlands and waterbodies or appropriate adjacent areas. In the event pesticides, fungicides, or herbicides are required in wetlands and waterbodies or appropriate adjacent and no general permit from the NYSDEC is available, the Certificate Holder shall secure the necessary permits from NYSDEC.

203. The supervising applicator shall be certified in accordance with all applicable NYS laws and shall be familiar with and understand the applicable provisions of this Certificate and the most recent version of the Certificate Holder's Vegetation Management Plan.

204. The Certificate Holder shall coordinate with LIPA and/or PSEG-LI as to vegetation clearing required for the Project in the vicinity of existing transmission and distribution lines and substations.

205. Unless described otherwise in the EM&CP, all trees over 4 inches in diameter (measured 4 ft [1.2 m] above ground) or shrubs over 4 ft (1.2 m) in height that are damaged or destroyed by the Certificate Holder's activities during construction, operation, or maintenance, (excluding any trimming of limbs or branches required to maintain safe work clearances) regardless of where located, shall be replaced by the Certificate Holder with the equivalent type trees or shrubs, subject to the provisions of 6 *NYCRR* Part 575, Prohibited and Regulated Invasive Species, except where:

a. equivalent-type replacement trees or shrubs would interfere with the proper clearing, construction, operation, or maintenance of the Project;

b. replacement would be contrary to sound ROW management practices or to any approved Vegetation Management Plan applicable to the Project; or

c. a property owner on whose land the damaged or destroyed trees or shrubs were located provides a written statement declining replacement (or other recorded easement or license holder with the right to control replacement declines replacement).

206. Clearing of natural vegetation shall be limited to the Commission-accepted Vegetation Management Plan and vegetation that poses a hazard or hindrance to construction activity and/or operation.

207. The Certificate Holder shall develop a Vegetation Restoration Plan, to be submitted as part of the Phase 1 EM&CP, that governs the off-roadway, onshore portion of the Project Corridor. The Vegetation Restoration Plan shall cover the following information:

a. The restoration (i.e., soil stabilization, seeding, planting) to be undertaken immediately following completion of construction and any post-construction assessment;

b. Specify the necessary planting density, if any, to minimize invasive species encroachment; and

c. Identify any existing forested areas, if any, that would be cleared during construction and required to be maintained post-construction to prevent reforestation.

W. **Restoration Activities**

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208. Unless otherwise specified in the EM&CP, Certificate Holder shall let the temporary construction area revegetate naturally or return to its original land use to the extent that it does not interfere with the inspection, operation, or maintenance of the utility facilities. The Certificate Holder will replant or reseed any existing vegetated areas of parkland and beach/dunes that are disturbed during construction. Except where otherwise specified in the EM&CP, stem-specific removal of trees or side trimming shall be conducted in accordance with long-range ROW management plans, real property rights; and provisions of any and all host community agreements, easements, leases, and/or license agreements.

X. **Decommissioning**

209. The Certificate Holder shall prepare a Primary Decommissioning Plan based on the final design of the Project, for inclusion in the post-Phase 1 EM&CP. Certificate Holder shall provide the Primary Decommissioning Plan to NYSDPS, NYSDEC, New York State Office of General Services (NYSOGS), NYSDOT, NYSAGM, NYSDOS, and LICFA at least 45 days prior to filing the post-Phase 1 EM&CP for review and comment. The Primary Decommissioning Plan shall include: (i) the anticipated life of the Project; (ii) estimates of the decommissioning costs (in current dollars; scrap and re-sale value cannot be used for offsetting of decommissioning costs) for the Project broken down by the component parts outlined in Condition 209 (a) (together, the Decommissioning Cost Estimate); (iii) the letters of credit or performance bond with surety available for decommissioning and restoration valued at the Decommissioning Cost Estimate; and (iv) procedures and timeframes for notifying landowners along the route about decommissioning activities. An outline of the Primary Decommissioning Plan is attached as Appendix R to the Joint Proposal.

a. For decommissioning purposes, the Project has four components:

i. that portion of the SRWEC–NYS from the boundary of New York State territorial waters to the MHWL (the New York State area under the jurisdiction of NYSOGS);

ii. that portion of the SRWEC–NYS from the MHWL to the Landfall Work Area, the onshore transmission cable, the OnCS–DC, and the Holbrook Expansion Area (together, the Onshore Transmission Facilities) under the jurisdiction of the NYSDOT (the New York State Area Under the Jurisdiction of NYSDOT)

iii. that portion of the Onshore Transmission Facilities under the jurisdiction of the County (the County Local Area); and

iv. that portion of the Onshore Transmission Facilities under the jurisdiction of the Town (the Town Local Area).

b. The Decommissioning Cost Estimate contained in the Primary Decommissioning Plan shall be updated based on the as-built Project, to reflect inflation, and any other increases due to labor or other costs, by a qualified independent engineer licensed in the state of New York, after 1 year of Project operation, and every fifth year thereafter. Such updates shall be filed (1 year after COD and every fifth year thereafter), with the Secretary to the Commission. Scrap and re-sale value cannot be used for offsetting of decommissioning costs in the required estimate updates. The value of the letters of credit secured for decommissioning purposes shall never be reduced below the initial Decommissioning Cost Estimate.

c. The Certificate Holder shall work with NYSDPS and/or the NYSOGS to craft a letter of credit that would establish a right for NYSOGS to draw on an irrevocable letter of credit in the event of the Certificate Holder's failure to timely decommission the facilities located in the New York State area under the jurisdiction of NYSOGS and restore that area in accordance with the Primary Decommissioning Plan (the NYSOGS Area Letter of Credit). The NYSOGS

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Area Letter of Credit shall state on its face that it is held by and for the sole benefit of NYSOGS. Similarly, the Certificate Holder shall work with NYSDPS and/or the NYSDOT to obtain a performance bond with surety in the event of the Certificate Holder's failure to timely decommission the facilities located in the New York State Area Under the Jurisdiction of NYSDOT and restore that area in accordance with the Primary Decommissioning Plan (the NYSDOT Performance Bond with Surety). The NYSDOT Performance Bond with Surety shall state on its face that it is held by and for the sole benefit of NYSDOT.

i. In the event either NYSOGS or NYSDOT refuses to or cannot be the beneficiary of the respective security, the Certificate Holder will work with NYSOGS and/or NYSDOT to establish an appropriate trust agreement with a third-party trustee that will hold the NYSOGS Area Letter of Credit and/or NYSDOT Performance Bond with Surety for the benefit of NYSOGS and/or NYSDOT to be funded in the appropriate amount pursuant to the Decommissioning Cost Estimate pursuant to the Commission's relevant order in this proceeding.

ii. Prior to the Commencement of Construction, the Certificate Holder shall submit to the Secretary to the Commission proof that both the NYSOGS Area Letter of Credit and NYSDOT Performance Bond with Surety have been obtained in the amount of the Decommissioning Cost Estimate as calculated pursuant to the Commission's relevant order in this proceeding. Both the letter of credit and performance bond with surety shall remain in place for the life of the Project, until it is decommissioned.

d. The Certificate Holder will secure letters of credit to be held by the Town and County, respectively, that would establish rights for the Town and County to draw on said security in the event of the Certificate Holder's failure to timely decommission the facilities located in the Town Local Area (the Town Letter of Credit) or the County Local Area (the County Letter of Credit) and restore those areas in accordance with the Primary Decommissioning Plan. The Town Letter of Credit will be held for the sole benefit of the Town and the County Letter of Credit will be held for the sole benefit of the County, and be, at a minimum, in the amount of the Decommissioning Cost Estimate as calculated pursuant to the Commission's relevant order in this proceeding.

i. In the event the Town and/or County ultimately refuses to be the beneficiary of such security, the Certificate Holder will work with NYSDPS to establish an appropriate trust agreement with a third-party trustee that will hold the relevant letter(s) of credit funded for the benefit of the Town and/or County, at a minimum, in the amount of the Decommissioning Cost Estimate as calculated pursuant to the Commission's relevant order in this proceeding.

ii. Prior to the Commencement of Construction, the Certificate Holder shall submit to the Secretary to the Commission proof that both the Town Letter of Credit and County Letter of Credit have been obtained in the amount of the Decommissioning Cost Estimate as calculated pursuant to the Commission's relevant order in this proceeding. Both letters of credit shall remain in place for the life of the Project, until it is decommissioned

e. Certificate Holder shall, if appropriate, engage the services of a trustee and enter into trust agreements for the administration of the funds from any of the securities outlined in Condition 209 (a). The form of any such trust agreement shall be filed with the Secretary with proof of obtaining the relevant security.

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f. All of the letters of credit and performance bond with surety for NYSDOT outlined in Condition 209 (a) shall provide that the beneficiaries thereof may, subject to the cure provisions set forth in the underlying letters of credit or performance bond with surety, exercise their right to draw on it following the occurrence of any of the events set forth in subsections (i) hereof:

i. Decommissioning will commence if: (1) the Project's construction has halted for a period of 12 continuous months, unless the 12-month period of inactivity is the result of reasonably unforeseen circumstances, recommencement is being actively pursued in good faith by the Certificate Holder, or the period of inactivity is due to a force majeure event; or (2) after commercial operation of the Project, if the Project has not generated electricity for a period of 12 continuous months, unless the 12-month period of no energy output is due to a force majeure event or the result of a repair, restoration, or improvement to an integral part of the Project that affects the generation of electricity and that repair, restoration, or improvement is being actively pursued in good faith by the Certificate Holder. The Certificate Holder shall file notice with the Secretary if it is anticipated that repairs or completion of construction (or similar) will extend beyond a 12-month inactive period; written notice shall also be provided to: (1) NYSDPS, NYSDEC, NYSDOT, and NYSDOS, and (2) and adjoining landowners of planned decommissioning and site restoration activities prior to commencement of those activities.

210. When Certificate Holder files its Phase 1 EM&CP, Certificate Holder will prepare a Short-Term Decommissioning Plan that will include the same information outlined above for the Primary Decommissioning Plan but only for those assets that are captured by the Phase 1 EM&CP. Certificate Holder will secure two a letters of credit for the Town and County and a performance bond with surety for the NYSDOT for the Phase 1 work: (1) for lands under the jurisdiction of the NYSDOT, (2) for lands under the jurisdiction of the Town, and (3) for lands under the jurisdiction of the County. Each letter of credit and performance bond with surety will be, at a minimum, in the amount of the decommissioning cost estimate included in the Short-Term Decommissioning Plan as approved by the Commission's relevant order issued in this proceeding to decommission any Phase 1 assets that are abandoned by the Certificate Holder in the event future phases of construction are not completed and the Project is not ultimately energized (together, the Short-Term Security). When construction commences on post-Phase 1 Project components, the Short-Term Security will be released and replaced in full by the letters of credit and performance bond with surety described in Condition 209 (a). In the event the NYSDOT, Town, or County cannot hold their respective Short-Term Security, the Certificate Holder will establish appropriate standby trusts to hold the same in accordance with the process outlined in Condition 209

H.5. References

See EIS Appendix K for list of references.