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Final Environmental Impact Statement for the Sunrise Wind Project

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Bureau of Ocean Energy Management

FINDING OF ADVERSE EFFECT FOR THE SUNRISE WIND FARM

NOVEMBER 2023

Version sent to Section 106 Consulting Parties for review on November 3, 2023.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT
STERLING, VIRGINIA

BOEM
Bureau of Ocean Energy Management

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LIST OF ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ADLS	aircraft detection lighting systems
APE	area of potential effects
ASLF/s	ancient submerged landscape feature/s
BOEM	Bureau of Ocean Energy Management
CHRVEA	Cumulative Historic Resources Visual Effects Analysis
COP	Construction and Operations Plan
EIS	Environmental Impact Statement
HRVEA	Historic Resources Visual Effects Assessment
Finding	finding of adverse effect
IPFs	impact-producing factors
km	kilometer
Lease Area	Renewable Energy Lease Area OCS-A 0487
MARA	Marine Archaeological Resources Assessment
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
MW	megawatt
NOI	notice of intent
NP&EDC	Nantucket Planning & Economic Development Commission
NPS	National Park Service
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966, as amended
nm	nautical miles
NRHP	National Register of Historic Places
OCS-DC	offshore converter station
OnCS-DC	onshore converter station
PA/s	programmatic agreement/s
PAPE	preliminary area of potential effect
PDE	Project Design Envelope
Project	Sunrise Wind Farm Project
RCG&A	R. Christopher Goodwin & Associates, Inc.
SAP	site assessment plan
SHPO/s	State Historic Preservation Officer/s
SEARCH	SEARCH, Inc.
Secretary	Secretary of the Interior
SRW	Sunrise Wind, LLC
SRWF	Sunrise Wind Farm
TARA	Terrestrial Archaeological Resources Assessment
TCP	Traditional Cultural Property
TJB	transition joint bay
THPO	Tribal Historic Preservation Officer

Tribes	federally recognized Native American Tribes/Tribal Nations
WTG	wind turbine generator

INTRODUCTION

The Bureau of Ocean Energy Management (BOEM) has made a finding of adverse effect (Finding), for the Sunrise Wind Farm (SRWF) Project (the Project) pursuant to 36 CFR 800.5, in compliance with Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA) (54 USC 306108; 54 USC 306107). The SRWF project is located in federal and New York State waters in Lease Area OCS-A 0487. BOEM finds that construction and installation, operations and maintenance, and conceptual decommissioning of the Project would adversely affect the 47 historic properties listed below. BOEM has determined that the introduction of wind turbine generators (WTGs) into views to and/or from the maritime setting of these 47 historic properties would diminish the integrity of these properties' historic setting and feeling. BOEM has also determined that SRWF project will contribute to cumulative visual effects to these 47 historic properties, including four National Historic Landmarks (NHLs) resulting from the construction and operation of the SRWF as well as other reasonably foreseeable offshore wind projects off the coasts of Massachusetts and Rhode Island. These 47 historic properties that BOEM has determined will be visually adversely affected are listed below.

Town of Aquinnah, Massachusetts:

- Gay Head Light (National Register of Historic Places [NRHP] Listed Resource)
- Gay Head – Aquinnah Shops Area (Massachusetts Historical Commission [MHC] Historic Inventory Site)
- Vanderhoop, Edwin DeVries Homestead (NRHP Listed Resource)
- Cooper, Tom House (MHC Historic Inventory Site)
- Gay Head – Aquinnah Coast Guard Station Barracks (MHC Historic Inventory Site)
- Haskins, Theodore House (MHC Historic Inventory Site)
- Gay Head – Aquinnah Town Center Historic District (NRHP-Listed Resource)
- 3 Windy Hill Drive (MHC Historic Inventory Site)
- 71 Moshup Trail (MHC Historic Inventory Site)
- Vanderhoop, Leonard House (MHC Inventory Site)
- Vineyard Sound and Moshup's Bridge Traditional Cultural Property (TCP) (NRHP-eligible Resource)

Town of Chilmark, Massachusetts:

- Hancock, Capt. Samuel – Mitchell, Capt. West House (NRHP-Eligible Resource)
- Flanders, Ernest House, Shop and Barn (MHC Historic Inventory Site)
- Hancock, Russell House (MHC Historic Inventory Site)
- Mayhew, Simon House (MHC Historic Inventory Site)
- Flaghole (MHC Historic Inventory Site)

Town of Edgartown, Massachusetts:

- Chappaquiddick Island TCP (NRHP-Eligible Resource)

Town of West Tisbury, Massachusetts:

- Scrubby Neck Schoolhouse (MHC Historic Inventory Site)

Town of Narragansett, Rhode Island:

- Point Judith Lighthouse (NRHP-Listed Resource)

City of Newport, Rhode Island

- Bellevue Avenue Historic District (National Historic Landmark [NHL])
- Ocean Drive Historic District (NHL)
- The Breakers (NHL)

Town of New Shoreham, Rhode Island:

- Block Island North Light (NRHP-Listed Resource)
- Corn Neck Road (NRHP-Eligible Resource)
- Hippocampus/Boy's Camp/Beane Family (NRHP-Eligible Resource)
- Mitchell Farm (NRHP-Eligible Resource)
- Champlin Farm (NRHP-Eligible Resource)
- Indian Head Neck Road (NRHP-Eligible Resource)
- Island Cemetery/Old Burial Ground (RI Historical Cemetery)
- Beach Avenue (RI Historical Cemetery)
- Old Harbor Historic District (NRHP-Listed Resource)
- Beacon Hill (NRHP-Eligible Resource)
- Spring House Hotel (NRHP-Eligible Resource)
- Spring House Hotel Cottage (NRHP-Eligible Resource)
- Capt. Welcome Dodge Sr. House (NRHP-Eligible Resource)
- Spring Street (NRHP-Eligible Resource)
- Caleb W. Dodge Jr. House (NRHP-Eligible Resource)
- WWII Lookout Tower – Spring Street (NRHP-Eligible Resource)
- Pilot Hill Road and Seaweed Lane (NRHP-Eligible Resource)
- WWII Lookout Tower at Sands Pond (NRHP-Eligible Resource)
- Lewis-Dickens Farm (NRHP-Eligible Resource)
- Block Island Southeast Lighthouse Historic Landmark (NHL)
- Miss Abby E. Vaill/1 of 2 Vaill Cottages (NRHP-Eligible Resource)
- Hon. Julius Deming Perkins/Bayberry Lodge (NRHP-Eligible Resource)
- Mohegan Cottage/Everett D. Barlow House (NRHP-Eligible Resource)
- Capt. Mark L. Potter House (NRHP-Eligible Resource)
- New Shoreham Historic District (Local Historic District)

PROJECT OVERVIEW

Sunrise Wind, LLC (SRW) submitted a Construction and Operations Plan (COP) on September 1, 2020, to BOEM proposing the construction and installation, operations and maintenance, and conceptual decommissioning of offshore wind energy facilities for the Sunrise Wind Farm (SRWF) project. SRWF is utilizing a project design envelope (PDE) in its COP, which represents a reasonable range of design parameters that may be used for the Project. In reviewing the PDE, BOEM is assessing the maximum impact scenario that could occur from any combination of the contemplated parameters. BOEM's review of the PDE may result in the approval of a project that is constructed within that range or a subset of design parameters within the proposed PDE.

The Sunrise Wind COP calls for the construction and operation of up to 122 WTGs, an offshore converter station (OCS-DC), and inter-array cables within Commercial Lease Area OCS-A 0487 approximately 16.4 nautical miles (nm; 30.4 kilometers [km]) south of Martha's Vineyard, Massachusetts, 26.5 nm (48.1 km) east of Montauk, New York, and 14.5 nm (26.8 km) from Block Island, Rhode Island. The COP also includes an offshore transmission cable from the OCS-DC in lease area OCS-A 0487 and to a landfall site on Long Island, New York, an onshore transmission cable, an interconnection cable to Long Island Power Authority Holbrook Substation, and an onshore converter station (OnCS-DC).

In October 2021, SRWF informed BOEM that they intended to revise the maximum number of WTGs for the project due to a maximum capacity limitation for infrastructure to receive power. Under the proposed change, the SRWF project calls for the installation and operation of up to 94 WTGs at 102 possible WTG positions. As a result, Sunrise Wind submitted a revised COP proposing the construction, operation, maintenance, and eventual decommissioning of the Project, with up to 102 WTGs with a nameplate capacity of 11 megawatts (MWs), OCS-DC, inter-array cables, OnCS-DC, an offshore transmission cable making landfall on Long Island, New York, and an onshore interconnection cable to the Long Island Power Authority Holbrook Substation.

BOEM is currently conducting its environmental and technical reviews of the COP and has published a draft environmental impact statement (EIS) under the National Environmental Policy Act (NEPA) for its decision regarding approval of the COP (BOEM 2022). The EIS information for the Project, including the revised COP, are available at https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-activities. The EIS considers the reasonable and foreseeable impacts of the Project, specifically analyzing impacts to cultural resources, including historic properties. BOEM is in the process of completing the final EIS on the Project at the time of this Finding release, and the Finding is consistent with final EIS information to date.

On July 17, 2023, the Lessee initiated onshore construction activities prior to the completion of Section 106 review of the undertaking and the NEPA review, and prior to the approval,

approval with conditions, or disapproval of the COP. Construction activities performed by the Lessee to date are summarized in Table 1.

Table 1: Onshore construction activities initiated by the Lessee prior to completion of BOEM NHPA Section 106 review.

Project Component	Description
OnCS-DC	Ground disturbance has included excavation for installation of stormwater basins/dry wells (1 acre [0.4 ha], 20 ft [6.1 m] deep); excavation for siting of foundations for control house and storage foundation (0.75 acres [0.3 ha], 5 in [12.7 cm] deep); site grading at eastern edge (1.5 acres [0.6 ha], 6 to 10 in [15.2 to 25.4 cm] deep); and asphalt milling for removal of an existing asphalt driveway (2 acres [0.8 ha], 2 to 3 in [5.1 to 7.6 cm] deep). In late 2023, the Lessee intends to initiate installation of additional foundations and equipment. Ground disturbance will include excavation of foundations for electrical equipment (up to approximately 30 ft [(9 m]) deep).
Northville laydown yard	Approximately 2 acres (0.8 ha) of the parcel is used as a laydown yard. This location is an industrial site that was previously cleared and graded to support various activities at the existing fuel terminal. The laydown yard required minimal grading and gravel/hardening to prepare it for use. Due to the lack of established topsoil, 4 to 6 in (10 to 15 cm) of existing grade was stripped and staged prior to the addition of modified millings.
Zorn laydown	Approximately 12.5 acres (5.0 ha) of this 20-acre (8.1 ha) site is utilized as a laydown yard. The site was previously cleared and graded to support the stockpiling of materials, parking and equipment storage during construction of the CLIEC facility. The laydown yard required minimal grading and gravel/hardening to prepare it for use. Existing topsoil was approximately 6 in (15 cm) and was stripped and staged prior to the addition of modified millings.
Onshore transmission cable	In late 2023, the Lessee intends to begin work on sections of the onshore transmission cable. Ground disturbance will occur along certain New York State Department of Transportation (NYSDOT) controlled rights-of-way (ROW) along a 4 mi (6.4 km) section of the Long Island Expressway South Service Road from Waverly Avenue to Horseblock Road and will include installation of splice vaults and duct banks (approximately 15 ft [(4.6 m]) deep for splice vaults and approximately 5 to 8 ft [(1.5 to 2.4 m]) for duct banks). Target burial depth will vary based on site-specific conditions. Following approval by NYSPSC (anticipated in late 2023), Sunrise Wind will initiate work on remaining sections of the Onshore Transmission Cable, as well as the Onshore Interconnection Cable. Ground disturbance will include installation of splice vaults and duct banks (approximately 15 ft [(4.6 m]) deep for splice vaults and approximately 5 to 8 ft [(1.5 to 2.4 m]) for duct banks). Target burial depth will vary based on site-specific conditions and may be deeper in areas of HDD or trenchless crossings.

These onshore construction activities are included in BOEM's definition of the undertaking, as defined below.

BACKGROUND

The Project is within a commercial lease area that has received previous Section 106 reviews by BOEM regarding the issuance of the commercial lease and approval of site assessment activities and is subject to two prior programmatic agreements (PAs).

In 2012, BOEM executed a PA among the State Historic Preservation Officers (SHPOs) of

Massachusetts (MA) and Rhode Island (RI), the Advisory Council on Historic Preservation (ACHP), the Mashpee Wampanoag Tribe, the Narragansett Indian Tribe, and the Wampanoag Tribe of Gay Head (Aquinnah) (see *Programmatic Agreement Among The U.S. Department of the Interior, Bureau of Ocean Energy Management; The State Historic Preservation Officers of Massachusetts and Rhode Island; The Mashpee Wampanoag Tribe; The Narragansett Indian Tribe; The Wampanoag Tribe of Gay Head (Aquinnah); and The Advisory Council on Historic Preservation; Regarding the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island [http://*www.boem.gov/MA-RI-PA-Executed]) (also referred to as the MA-RI PA) and concurrently conducted a Section 106 review of its decision to issue commercial leases within the RI-MA Wind Energy Areas (WEAs).

In 2013, BOEM prepared an environmental assessment to analyze the environmental impacts associated with issuing commercial wind leases and approving site assessment activities within the RI-MA WEAs. On July 31, 2013, BOEM conducted a competitive auction and awarded Lease OCS-A 0487, consisting of about 67,250 acres, to Deepwater Wind New England, LLC.

On August 3, 2020, Deepwater Wind New England, LLC assigned Lease OCS-A 0487 to Sunrise Wind, LLC. On September 3, 2020, Bay State Wind, LLC assigned 100 percent of its record title interest in a portion of lease OCS-A 0500, which BOEM designated OCS-A 0530, to Sunrise Wind, LLC. On March 15, 2021, BOEM completed the consolidation of lease OCS-A 0530 into Lease OCS-A 0487 through an amendment to Lease OCS-A 0487. The resulting lease area is 109,952 acres. The effective date of lease OCS-A 0487 remains October 1, 2013. On September 18, 2018, Deepwater Wind New England, LLC requested an extension of the site assessment term for commercial lease OCS-A 0487 pursuant to 30 CFR 585.235(b). BOEM approved on October 23, 2018, a 3.5-year extension of the site assessment term, from July 1, 2019, to January 1, 2023 .

Subsequent to the award of the lease, SRWF submitted a site assessment plan (SAP) describing the proposed construction, operation, maintenance, and decommissioning of a stand-alone offshore meteorological data collection system. BOEM had previously determined that a federal review of a SAP is subject to review under Section 106 of the NHPA. Pursuant to the MA-RI PA, BOEM conducted a NHPA Section 106 review of the proposed SAP, resulting in the September 21, 2016, Finding of No Historic Properties Affected for Approval of the Deepwater Wind Site Assessment Plan on the Outer Continental Shelf Offshore Rhode Island (https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/HP/RI-SAP-Finding.pdf).

UNDERTAKING

BOEM has determined that the construction, operation, maintenance, and decommissioning of the Project is the undertaking and is subject to a review pursuant to Section 106 of the

NHPA and its implementing regulations (36 CFR 800). Further, BOEM determined that the activities proposed under the COP have the potential to affect historic properties. Detailed information about the Project, including the COP and its appendices, can be found on BOEM's website (see https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-activities). Confidential appendices to the COP referenced in this document, and their revisions, were provided to all consulting parties in December 2022 and again in November 2023. The COP, as well as its public and confidential appendices, is hereby incorporated by reference.

BOEM notified Massachusetts SHPO, Rhode Island SHPO, Connecticut SHPO, New York SHPO and ACHP on August 31, 2021 of their decision to use NEPA substitution for Section 106 pursuant to 36 CFR 800.8(c). The Section 106 and NEPA reviews included four action alternatives as described in the EIS (**Table 2**). Figure 1-Figure 10 provide maps of the four proposed action alternatives.

Table 2. Description of Action Alternatives Reviewed in the EIS.

Alternative	Description (from BOEM 2022)
A – No Action Alternative	Under the No Action Alternative, BOEM would not approve the COP. Project construction and installation, O&M, and decommissioning would not occur, and no additional permits or authorizations for the Project would be required. Any potential environmental and socioeconomic impacts, including benefits, associated with the Project as described under the Proposed Action would not occur. However, all other past and ongoing impact-producing activities would continue. Under the No Action Alternative impacts to marine mammals incidental to construction activities would not occur. Therefore, NMFS would not issue the requested authorization under the MMPA to the applicant. The current resource condition, trends, and impacts from ongoing activities under the No Action Alternative serve as the existing baseline against which the direct and indirect impacts of all action alternatives are evaluated.
B – Proposed Action	The Proposed Action would construct, operate, maintain, and decommission an approximately 1,034-MW wind energy facility on the OCS offshore of Massachusetts, Rhode Island, and New York within the range of design parameters described in the Sunrise Wind COP, as described in the Project Overview in this document.,
C – Fisheries Habitat Impact Minimization	Under Alternative C, the construction, O&M, and eventual decommissioning of up to a 1,034-MW wind energy facility on the OCS offshore of Massachusetts, Rhode Island, and New York would occur within the range of the design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C is proposed with the intent to minimize impacts to fisheries habitats in the proposed Project Area that are the most vulnerable to long-term impacts. This alternative considered and prioritized contiguous areas of complex bottom habitat to be excluded from development to potentially avoid and minimize impacts to complex fisheries habitats, while still meeting BOEM's purpose and need for the project. Under the Fisheries Habitat Impact Minimization Alternative, BOEM is considering five (5) variants of the alternative (C-1, C-2, C-3A, C-3B, and C-3C). Additional information about these variants is provided below.
C-1 – Fisheries Habitat Impact Minimization Alternative 1	Sunrise Wind's proposed layout includes 102 WTG positions; however, only 94 11-MW WTGs would be needed to meet the Project's maximum capacity of up to 1,034 MW2F . Under Alternative C-1, the construction and installation, O&M, and eventual decommissioning of a wind energy facility and an OCS-DC would occur within the design parameters outlined in the Sunrise Wind Offshore Wind ProjectSunrise Wind Farm COP

	(Sunrise Wind 2022) subject to applicable mitigation measures. However, certain WTG positions would be excluded from the identified Priority Areas to reduce impacts to sensitive benthic habitats and areas where Atlantic cod spawning has been detected. Under this alternative, the Project would maintain a uniform east-west and north-south grid of 1 by 1-nautical mile (nm) spacing between WTGs. Alternative C-1 would result in the exclusion of up to eight WTG positions from the identified Priority Areas to reduce impacts to sensitive benthic habitat Atlantic cod spawning areas.
C-2 – Fisheries Habitat Impact Minimization Alternative 2	Under Alternative C-2, up to eight WTG positions identified for exclusion from development in Alternative C-1 would remain the same, and up to an additional 12 WTG positions would be removed from the Priority Areas and relocated to the eastern side of the Lease Area. The construction and installation, O&M, and eventual decommissioning of a wind energy facility and an OCS-DC would occur within the design parameters outlined in the Project COP (Sunrise Wind 2022) subject to applicable mitigation measures. The Project would maintain a uniform east-west and north-south grid of 1 by 1-nm spacing between WTGs. Alternative C-2 assumes that habitat on the eastern side of the Lease Area is suitable for development. Geotechnical and geophysical surveys conducted in 2022 will help inform the feasibility of Alternative C-2. Alternative C-2 considers four WTG position configurations (C-2a, C-2b, C-2c, and C-2d) to address NMFS priority areas, provide continuous habitat, and avoid boulder fields. All eight positions identified in Alternative C-1 would remain excluded for development in all alternate configurations. An additional 12 WTG positions were selected for relocation based on a similar analysis for Alternative C-1.
C-3 – Glauconite Soil Avoidance (Alternatives C-3a, C-3b, and C-3c)	Alternative C-3 was developed following publication of the DEIS Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands present within the southeastern and eastern portions of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c consider different WTG configurations to avoid sensitive habitats and engineering constraintsto best reduce impacts while still meeting the New York State Energy Research and Development Authority's Offshore Wind Renewable Energy Certificate Purchase and Sale Agreement. An ancillary habitat impact minimization benefit of this alternative is that 13 WTGs are removed from Priority Areas 2 and 3 because of the presence of glauconite sands. Under Alternatives C-3b and C-3c, some WTG positions may also be removed from Priority Area 1. Under Alternative C-3A, up to 87 WTGs at 87 potential positions will be constructed, removing up to 7 WTGs from Priority Areas identified in Alternatives C, C-1, and C-2. Under Alternative C-3B, up to 84 WTGs at 87 potential positions, excluding 3 WTG locations in Priority Area 1, and up to 7 additional WTGs from other Priority Areas, as described in Alternatives C, C-1, and C-2. Under Alternative C-3C, up to 80 WTGs at 87 potential positions, excluding 7 WTGs from Priority Area 1, and up to 7 additional WTGs from other Priority Areas, as described in Alternatives C, C-1, and C-2.

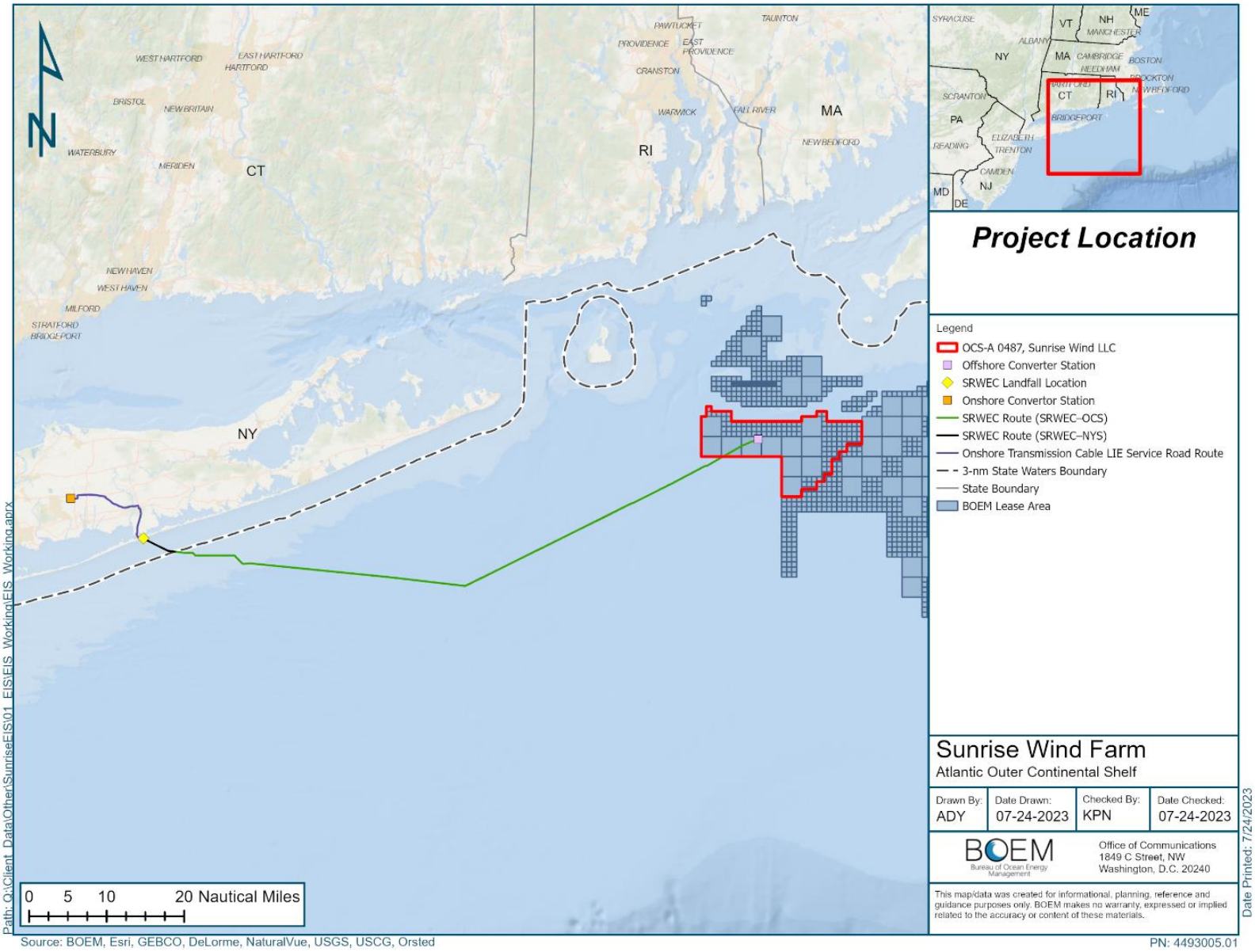

Figure 1: Alternative B (Proposed Action)

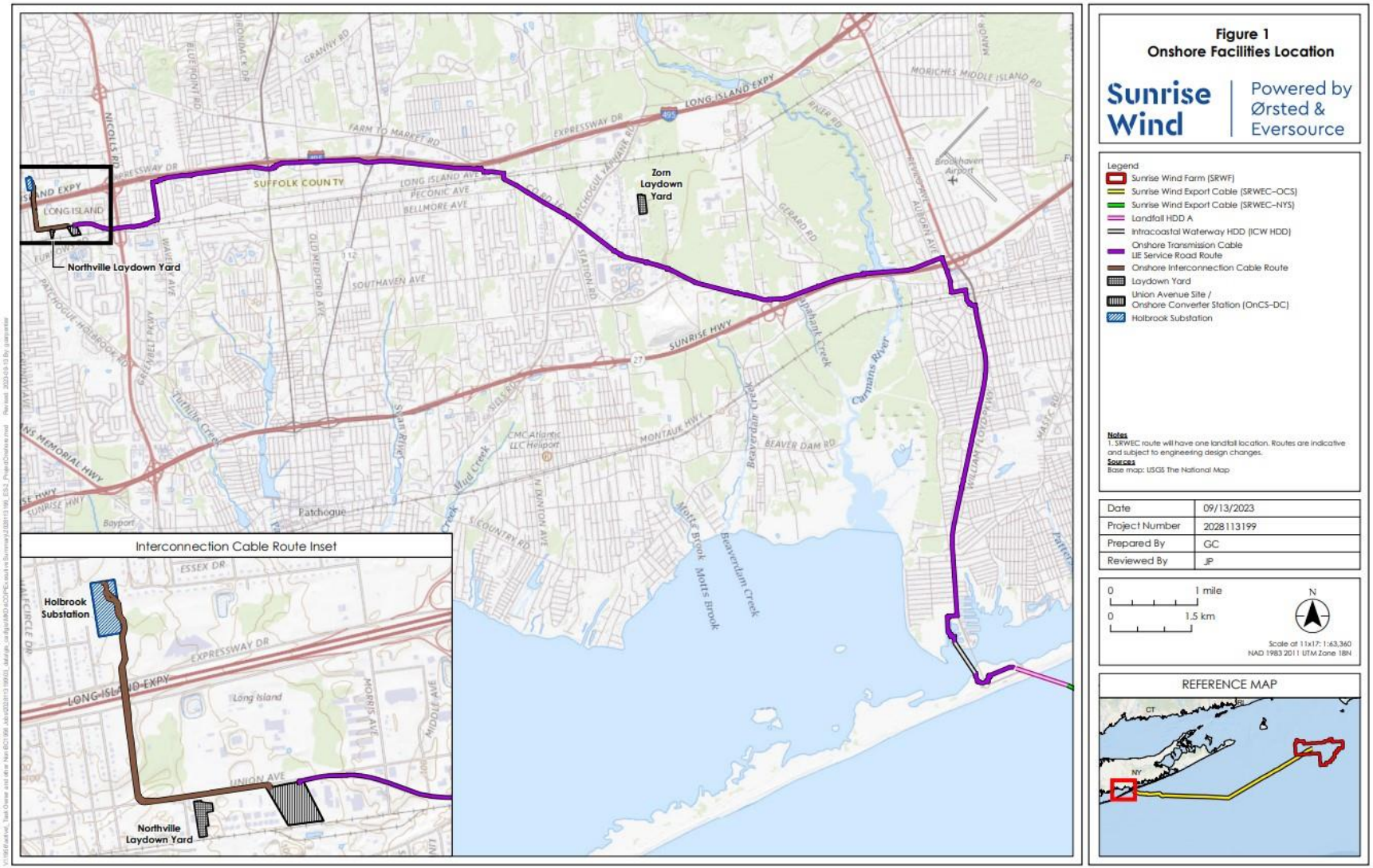

Figure 2: Alternative B Onshore Components

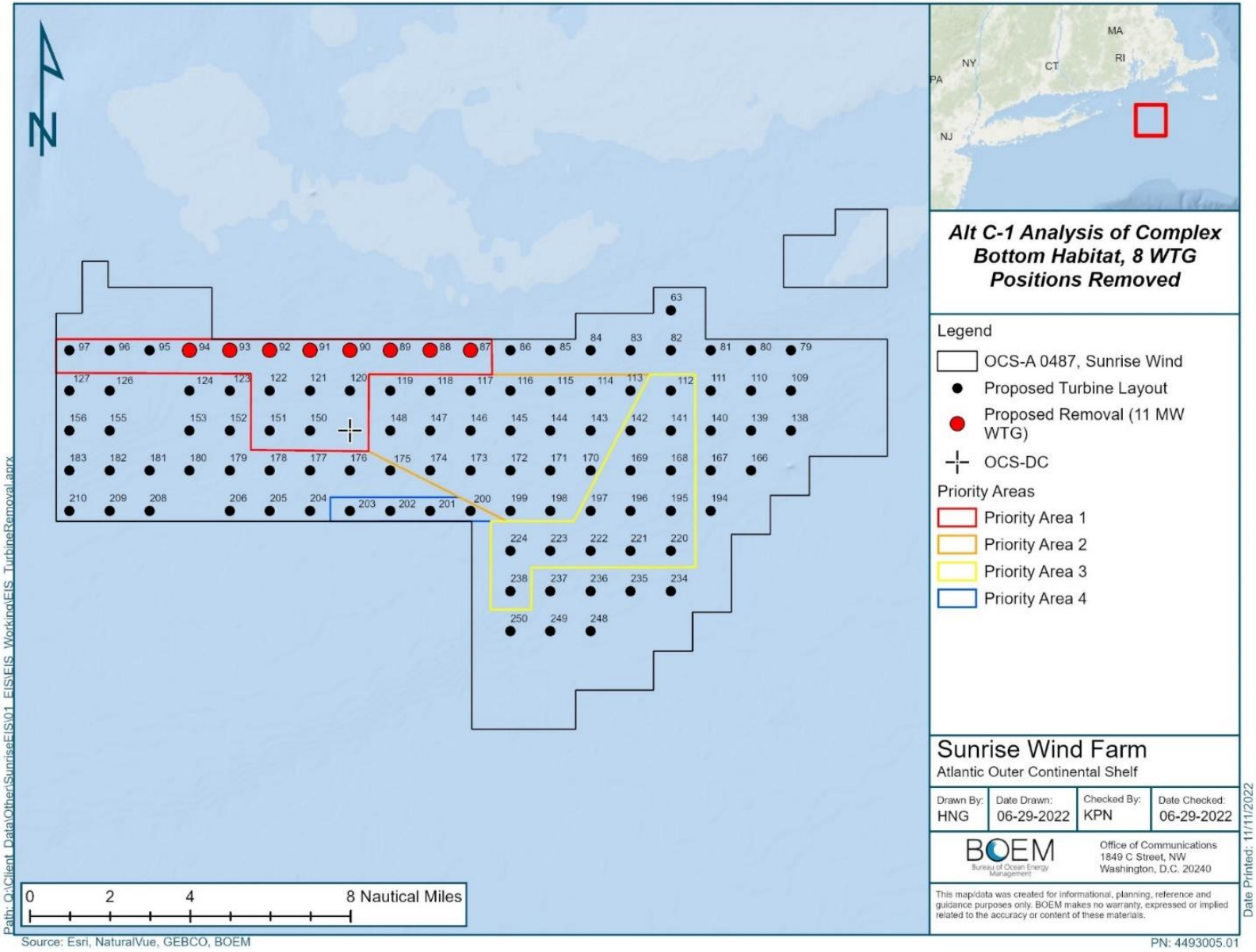

Figure 3: Alternative C-1 Fisheries Habitat Impact Minimization Alternative 1

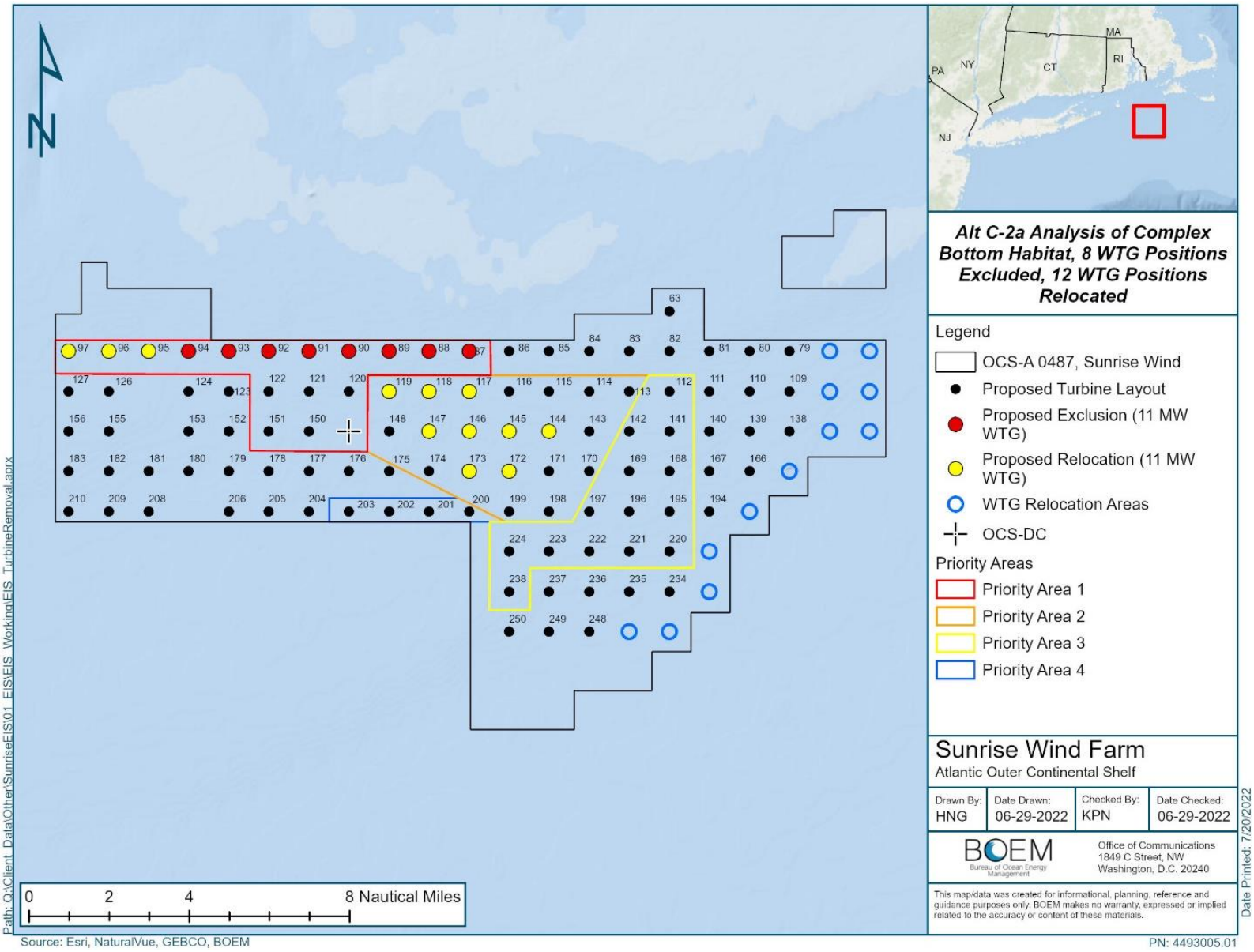

Figure 4: Alternative C-2a

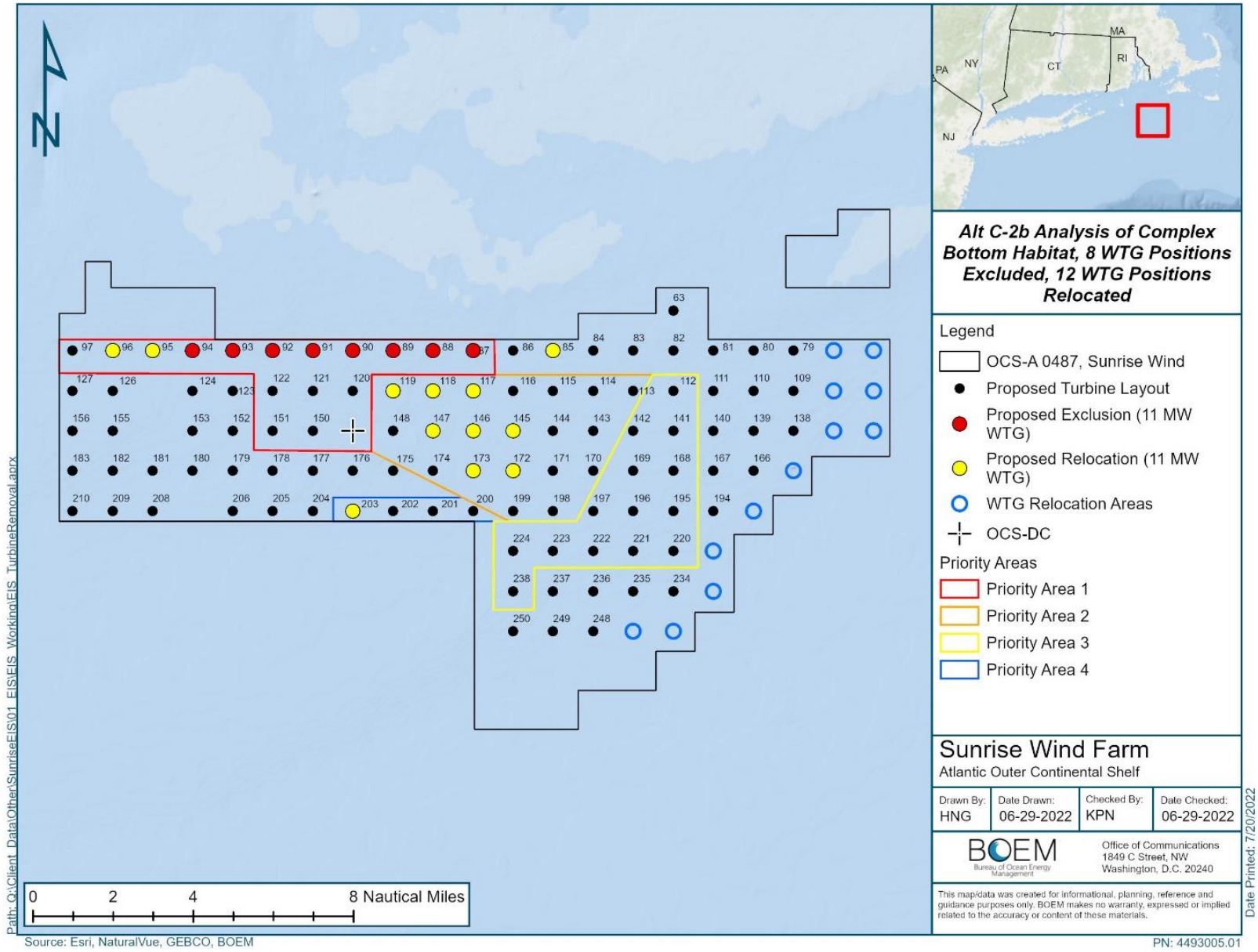

Figure 5: Alternative C-2b

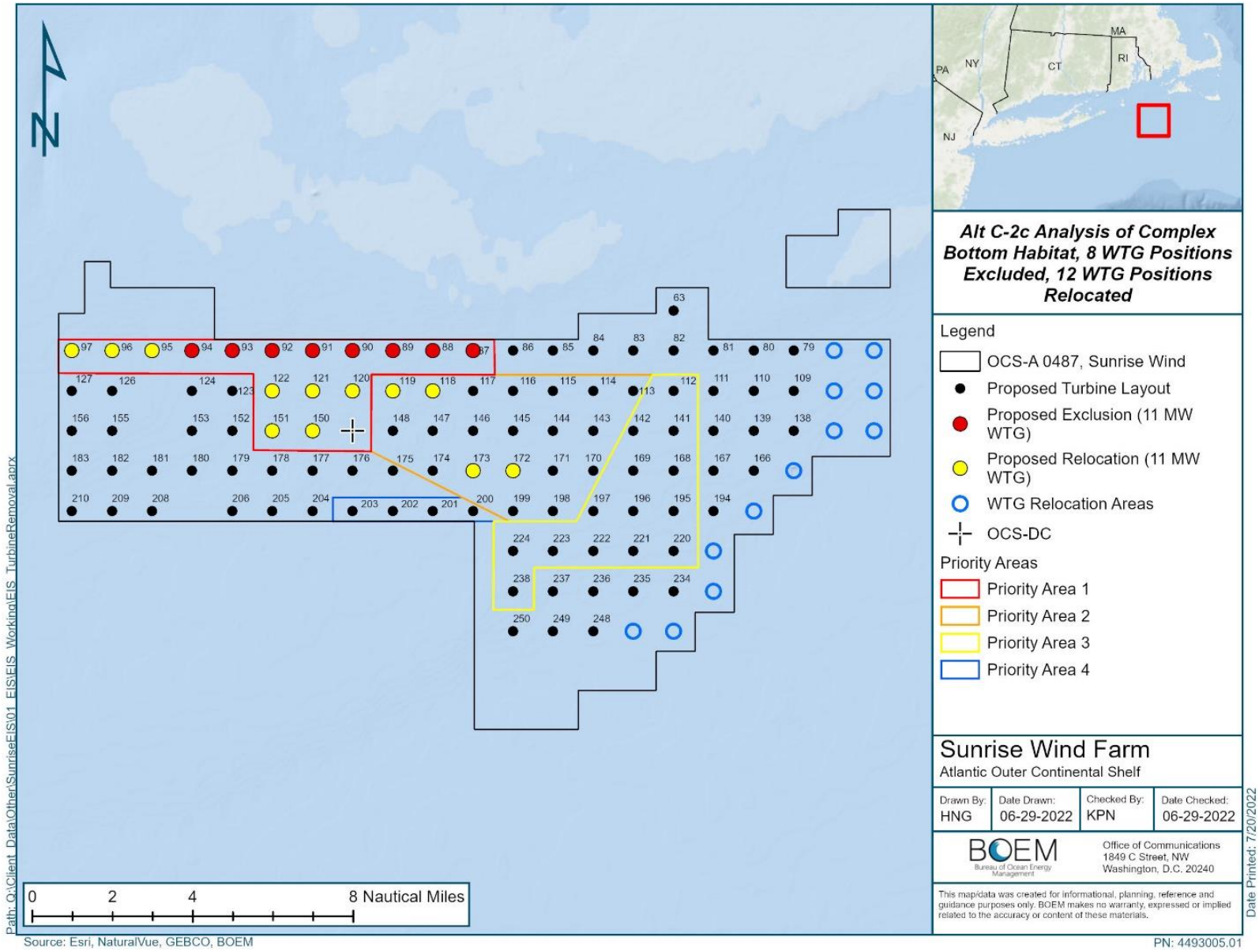

Figure 6: Alternative C-2c

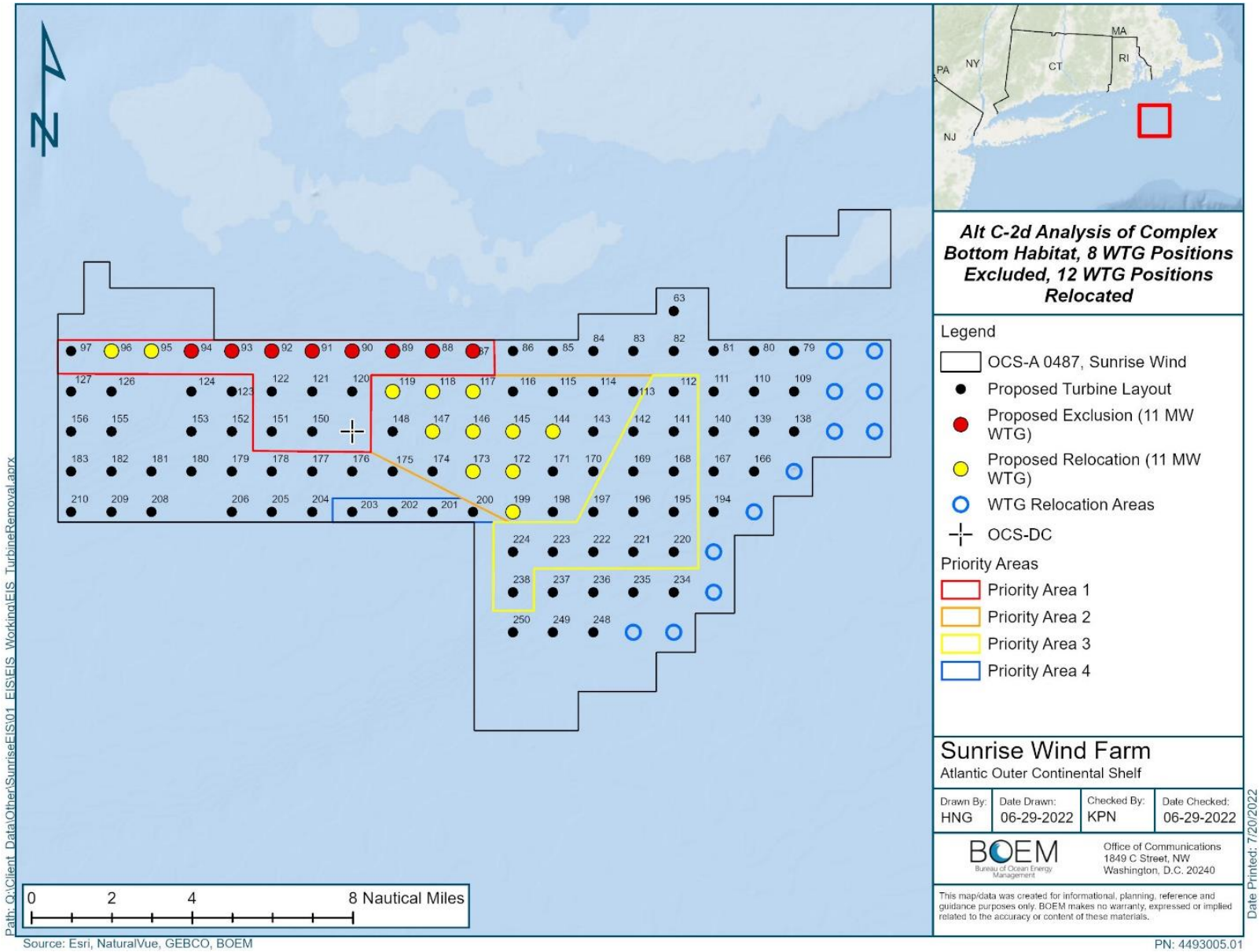

Figure 7: Alternative C-2d

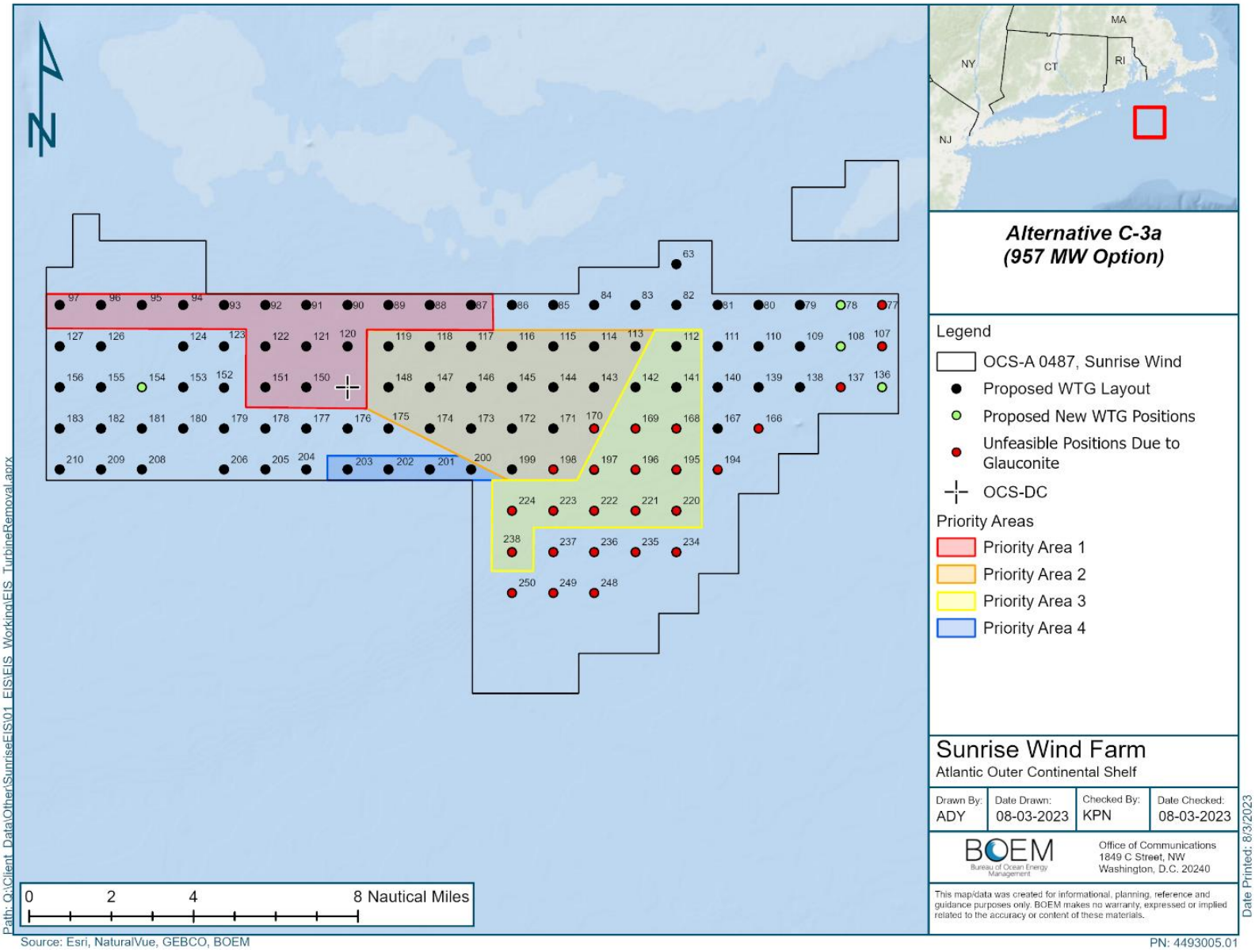

Figure 8: Alternative C-3a

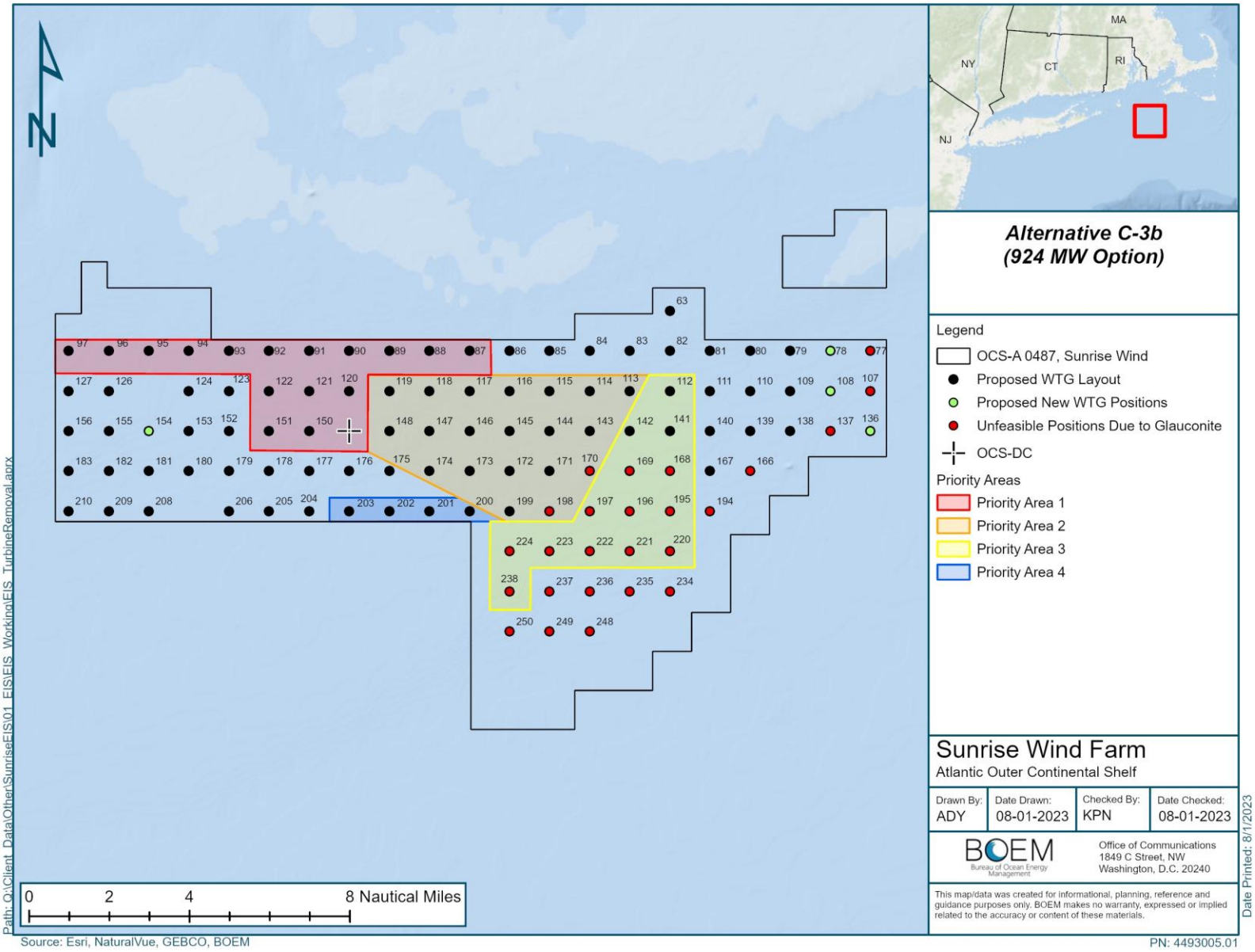

Figure 9: Alternative C-3b

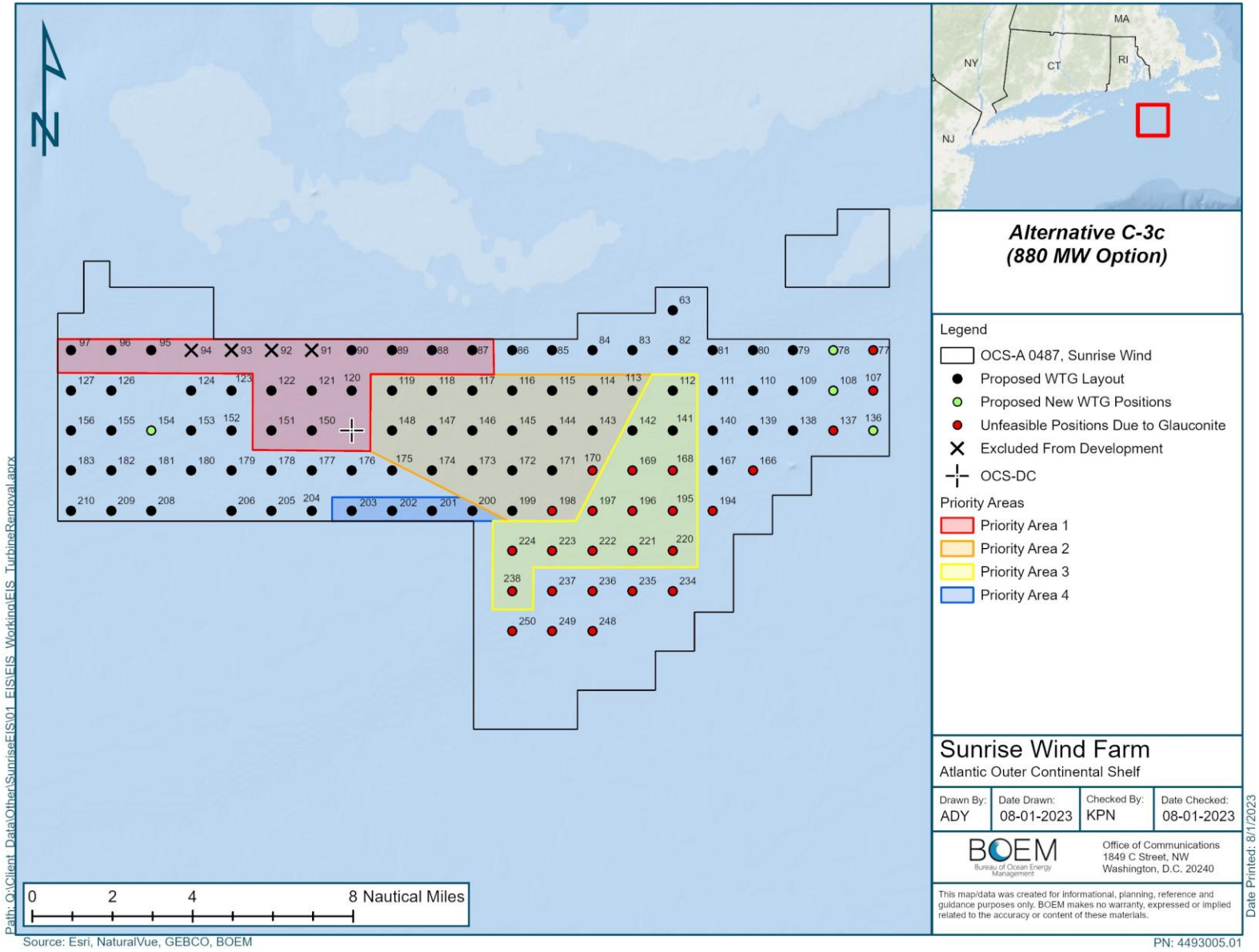

Figure 10: Alternative C-3c

AREA OF POTENTIAL EFFECTS

Section 106 of the NHPA defines the Area of Potential Effects (APE) as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of Historic Properties, if any such properties exist (36 CFR 800.16(d)). Per BOEM's *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585* (Guidelines), BOEM has defined the Area of Potential Effects (APE) for this undertaking to include the following geographic areas:

- The depth of and breadth of the seabed potentially impacted by any bottom-disturbing activities, constitution the marine archaeological resources portion of the APE (marine APE);
- The depth and breadth of terrestrial areas potentially impacted by any ground-disturbing activities, constituting the terrestrial archaeological resources portion of the APE (terrestrial APE);
- The viewshed from which renewable energy structures, whether located offshore or onshore, would be visible, constituting the viewshed portion of the APE (visual APE); and
- Any temporary or permanent construction or staging areas, both onshore and offshore, which may fall into any of the above portions of the APE.

Effects are only assessed to historic properties within the APE for the Project. This includes reasonably foreseeable effects caused by the Project that may occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5(a)(1)). The marine archaeological APE includes the offshore areas for all three NEPA action alternatives.

Marine Archaeological Resources Area of Potential Effects

The marine APE for the Project is the depth and breadth of the seabed potentially affected by any bottom-disturbing activities and temporary or permanent offshore construction or staging areas. The APE includes a conservative PDE that can accommodate several potential WTG designs and installation methods, whether monopile or jacketed foundations are used, installed by jack-up vessels, as well as necessary support vessel and barge anchoring areas. The marine APE encompasses activities within the Lease Area and activities within the SRWEC corridor.

Table 3 contains summary information about the proposed SRWF infrastructure to be constructed within the marine APE.

Table 3: Proposed SRWF Project Components within the Marine APE

Proposed Infrastructure	Description
WTG and OCS-DC Foundations	• Monopile foundations for the WTGs and a piled jacket foundation for the OCS-DC • Up to 95 foundations for the WTGs and OCS-DC within 102 potential positions • Maximum embedment depth of up to 164 ft (50 m) for WTG monopile foundations and 295 ft (90 m) for OCS-DC piled jacket foundation • Maximum area of seafloor footprint per foundation, inclusive of scour protection and cable protection system stabilization: 1.06 ac (4,290 m^2) for WTG monopile foundations and 1.39 ac (5,625 m^2) for the OCS-DC foundation structure
Inter-array Cables	• Maximum 161-kV AC cables buried up to a target depth of 4 to 6 ft (1.2 to 1.8 m) • Maximum total length of up to 180 mi (290 km) • Maximum cable diameter of 8 in (200 mm) • Maximum disturbance corridor width of 98 ft (30 m) per circuit
Export Cable	• One 320-kV DC export cable bundle buried to a target depth of 4 to 6 ft (1.2 to 1.8 m) in federal waters and buried to a target depth of 6 ft (1.8 m) in NYS waters • Maximum individual cable diameter of 7.8 in (200 mm) and maximum bundled diameter of 15.6 in (400 mm) • Maximum total corridor length of up to 104.6 mi (168.4 km) • Maximum disturbance corridor width of 98 ft (30 m) • Maximum seafloor disturbance for horizontal directional drilling (HDD) exit pit of 61.8 ac (25 ha)

The Lease Area encompasses 109,952 acres (ac) (44,496 hectares [ha]). Within the Lease Area, the wind farm development would occur in a smaller footprint of 106,394 ac (43,056 ha) with water depths ranging from 134 to 184 feet (ft) (41 to 56 meters [m]). Sunrise Wind proposes up to 94 WTGs and one OCS-DC at 102 possible locations within the extent of the PDE. Construction activities would occur within a 1.06 ac (4,290 square meters [m^2]) work zone around each WTG location, and within a 2.64 ac (10,684 m^2) area for the OCS-DC foundation structure.

The marine APE also includes all offshore areas where seafloor-disturbing activities from inter-array cable trenching and installation, boulder relocation, and vessel anchoring may occur. The maximum vertical extent of seafloor impact would be approximately 164 ft (50 m) below the seafloor for WTGs and approximately 295 ft (90 m) for OCS-DC. The array and substation interconnector cables have a target burial depth of 3 to 7 ft (1 to 2 m) below the stable seabed.

The marine APE also includes an offshore export cable corridor extending from the Lease Area to the sea-to-shore transition at landfall location in Brookhaven. The export cable corridor would be a maximum width of 98 ft (30 m) which would include the cable installation trench. Dynamic Positioning (DP) vessels will generally be used for cable burial activities. If anchoring (or a pull ahead anchor) is necessary during cable installation, it will occur within a corridor ranging in width from 1,312 ft to 2,625 ft (400-800 m). The SRWEC route would be approximately 104.6 mi (168.4 km). Offshore export cables would typically be buried to a depth of 4 to 6 ft (1.2 to 1.8 m) below the seabed similarly to the array cables. Based on the potential limits of disturbance, from cable installation and potential anchoring impacts, the APE for the offshore export cable corridor is 1,312 ft to 2,625 ft (400-800 m) wide, 104.6 mi (168.4 km) long, and 4 to 6 ft (1.2 to 1.8 m) deep.

Terrestrial Archaeological Resources Area of Potential Effects

The terrestrial APE includes areas of potential ground disturbance associated with the onshore construction and operation of the undertaking). The APE is presented as a conservative PDE and consists of the depth and breadth of potential ground-disturbing activities are described below in **Table 4**.

Table 4: Proposed SRWF Project Components within the Terrestrial APE

Proposed Infrastructure	Description
OnCS-DC	• An OnCS–DC requiring the disturbance of 7 acres during construction and with an operational footprint of up to 6 ac (2.4 ha) which will include electrical equipment, a control house and storage structure, and stormwater basins/dry wells. • The entire station footprint area will be graveled and surrounded by a 7-ft (2.1-m)-high fence topped with a 1-ft (0.3-m) tall, barbed wire extension for a total height of 8 ft (2.4 m). • The majority of the site equipment will require shallow foundations, 4 to 5 ft (1.2 to 1.5 m) in depth based on the expected equipment size. Larger structures may require drilled shaft equipment foundations of 12 to 30 ft (4 to 9 m) in depth. • Stormwater basins/dry wells (1 acre [0.4 ha], 20 ft [6.1 m] deep)
Northville Laydown Yard	• Approximately 2 acres (0.8 ha) of the parcel is used as a laydown yard. • The laydown yard required minimal grading and gravel/hardening to prepare it for use, requiring the removal of 4 to 6 in (10 to 15 cm) of existing grade followed by the addition of modified millings.
Zorn Laydown Yard	• Approximately 12.5 acres (5.0 ha) of this 20-acre (8.1 ha) site is utilized as a laydown yard. • The laydown yard will require approximately 6 in (15 cm) to be stripped/graded from the ground surface and staged prior to the addition of modified millings.

Proposed Infrastructure	Description
Onshore Transmission Cables, Interconnection Cables, and Fiber Optic Cables	• Two transmission and two fiber optic cables collocated in an underground duct banks and splice vaults. • Up to 12 interconnection cables and 2 fiber optic cables collocated in an underground duct bank and splice vaults. • Combined length of transmission and interconnection cables will be 17.5 mi (28.2 km) long installed within a 8 ft (2.4 m) wide trench, with a temporary construction disturbance corridor of 30 ft (9.1 m) • Transmission cables and fiber optic cables installed in a subsurface duct banks buried at a target depth of 5 to 8 ft [(1.5 to 2.4 m]) • Splice vaults will be located approximately every 1,800 to 2,200 ft (549 to 671 m) along the transmission cable route and will require a disturbance area of 50 ft x 40 ft (15 m x 12 m) and be buried at a depth of up to 15 ft (4.6 m) • Maximum transmission cable diameter of 6 in (152 mm) and maximum fiber optic cable diameter of 1 in (2.5 cm)
Landfall Location	• Transition Joint Bay (TJB), link boxes, and fiber optic cable joint boxes will be located entirely within the Landfall Work Area at Smith Point County Park on Fire Island. • TJB is a pit that is dug in the soil and lined with concrete and will be up to 82 ft x 16 ft x 16 ft (25 m x 5 m x 5 m). • Should a fiber optic cable joint box and link box be required, an additional concrete pit approximately 6.6 ft x 6.6 ft x 6.6 ft (2 m x 2 m x 2 m) will be needed for each joint box. • Maximum disturbance for Landfall Work Area (onshore) of up to 6.5 ac (2.6 ha)

The terrestrial APE includes the sea-to-shore transition landfall site. The transition of the export cables from offshore to onshore would be accomplished by using open-cut trenching or trenchless methods. Ground-disturbing activities from the installation of the transition joint bay (TJB) and associated excavation would occur at the Brookhaven landfall site. From the TJB at the landfall site, Sunrise Wind would install the onshore export cable underground. Burial of the export cable in a single duct bank would require up to a 30 ft wide (9.1 m wide) construction corridor up to 6 feet (1.8 m) deep for onshore export cable corridors, excluding the landfall location and cable splice locations. Splice locations along the transmission cable route will require a disturbance area of 50 ft x 40 ft (15 m x 12 m) with the splice vaults buried at a depth of up to 15 ft (4.6 m). The onshore cable would connect to the proposed onshore converter parcel. Ground-disturbing activities associated with the construction of the Brookhaven converter station would occur on a 7 ac (2.84 ha) parcel. An Onshore Interconnection Cable would connect the Onshore Converter Station at Brookhaven to the Holbrook Substation.

BOEM defines the terrestrial APE for this undertaking to include offsite borrow and fill disposal sites pursuant to the ACHP's guidance and recommendations (https://www.achp.gov/sites/default/files/guidance/2018-08/off-site_borrow_and_disposal.pdf).

Area of Potential Effects for Visual Effects Analysis

The visual APE includes the viewshed from which renewable energy structures—whether offshore or onshore—would be visible. Offshore, the visual study area consists of a 40 mi (64 km) radial distance from the Wind Farm Area, which is the approximate maximum theoretical distance at which the WTGs could be visible due to variables such as the curvature of the earth—a distance that does not factor in certain conditions such as weather, environmental conditions, or screening by landscape features. (COP Appendix Q1). The summary information on the proposed SRWF project components used to determine the visual APE is provided in **Table 5**.

Table 5: Proposed SRWF Project Components Used to Determine the Visual APE

Proposed Infrastructure	Description
WTGs	• Up to 94 WTGs within 102 potential positions • Nameplate capacity of 11 MW • Rotor diameter of 656 ft (200 m) • Hub height of 459 ft (140 m) above mean sea level (AMSL) • Upper blade tip height of 787 ft (240 m) AMSL
OCS-DC	• One OCS-DC • Up to 100 ft (30 m) total structure height from above ground level (including lightning masts)

Sunrise Wind, LLC conducted a geographic information system (GIS) analysis and subsequent field investigation through a series of steps, beginning where the maximum theoretical distance WTGs could be visible. This was determined by first considering the visibility of a WTG from the water level to the tip of a vertical rotor blade at the height of 968 ft (295 m). The Project's proposed alternatives include a selection of up to 94 WTGs at 102 possible positions within the Lease Area, and the Project would utilize an 11 MW turbine. The 11 MW turbine was selected as the Project's nameplate wind turbine size (see Section 2.2 of the EIS for a discussion of alternatives considered but dismissed from further analysis) and consists of a nacelle height of 459 ft (140 m), a rotor diameter of 656 ft (200 m), and a maximum blade tip height of 787 ft (240 m).

The Visual APE presented herein considers up to 122 WTGs with a nacelle height of 574 ft (175 m), a 787 ft (240 m) rotor diameter, and a maximum blade tip height of 968 ft (295 m). The WTG specifications evaluated in the visual impact analysis reports represent the Project's original PDE dated August 2020, which included a wider range of turbine size (8 - 15 MWs) and included up to 122 WTGs. These 122 WTGs were extrapolated from a PDE that included 122 WTGs and a single OCS-DC or 120 WTGs and three OCS-DCs, as presented in the Visual Impacts Assessment (VIA; SRWF COP Appendix Q1). The VIA asserts that the distinction between the counts of WTGs and OCS-DCs is not anticipated to change the overall results of the VIA in this instance.

BOEM considers the evaluation of these more numerous and larger WTGs to represent a reasonable and good faith effort to identify potential effects to cultural resources and historic properties, and that analysis based on these evaluations is sufficient for the purposes of evaluating impacts to cultural resources under NEPA and adverse effects to historic properties under the NHPA Section 106 review because it evaluates a larger, more impactful scenario.

The analysis then accounted for how distance and environmental conditions impede visibility as the distance increases between the viewer and WTGs (i.e., by a 40 mi (64 km) distance, even blade tips would be below the sea level horizon line).

The mapping effort then removed all areas with obstructed views toward WTGs, such as those views impeded by intervening topography, vegetation, and structures. Areas with unobstructed views of offshore Project elements constitute the visual Preliminary APE, which is documented in the HRVEA, COP Appendix T (Sunrise Wind 2022). Onshore, the visual APE includes a 1.0 mi (1.6 km) buffer around the Brookhaven converter station location (COP, Appendix U; Sunrise Wind 2022). All other elements would be underground and would not be visible. BOEM has reviewed the methodology used by Sunrise Wind, LLC to define the APE and the results of the GIS analysis. BOEM has determined that the methods used to define the Preliminary APE are methodologically sound and sufficient for the purposes of the NHPA Section 106 review. As a result, the Preliminary APE for Visual Effects defined in the SRWF HRVEA has been adopted by BOEM as the APE for the purposes of the NHPA Section 106 review of the SRWF COP.

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STEPS TAKEN TO IDENTIFY HISTORIC PROPERTIES

TECHNICAL REPORTS

To support the identification of historic properties within the APE, SRWF has provided survey reports detailing the results of multiple investigations within the marine, terrestrial, and visual portions of the APE. **Table 6** provides a summary of these efforts to identify historic properties and the results/key findings of each investigation. BOEM has reviewed all reports summarized in Table 6. Summary of Cultural Resources Investigations Performed by SRWF in the Marine, Terrestrial and Visual APEs.**Table 6** and found them to be sufficient. BOEM found that the Preliminary APE or PAPE proposed by SRWF is appropriate for the magnitude, extent, location, and nature of the undertaking. Further, BOEM has determined that the reports collectively represent a good faith effort to identify and evaluate historic properties within the APE, they are sufficient to apply the Criteria of Adverse Effect, and they support consultation with consulting parties regarding the resolution of adverse effects to historic properties.

SEARCH, Inc. (SEARCH) prepared a technical report for BOEM to support BOEM's cumulative effects analysis entitled *Cumulative Historic Resources Visual Effects Analysis Management Summary for the Sunrise Wind Farm* (CHRVEA; SEARCH 2022). The cumulative historic resources visual effects analysis (CHRVEA) presents the analysis of cumulative visual effects where BOEM has determined in its review of the *Onshore Above-ground Historic Properties Report* (COP Appendix U, Sunrise 2022) that historic properties would be adversely affected by the Project.

Table 6. Summary of Cultural Resources Investigations Performed by SRWF in the Marine, Terrestrial and Visual APEs.

Portion of APE	Report	Description	Key Findings/Recommendations
Offshore	Phase I Marine Archaeological Resources Assessment for the Sunrise Offshore Wind Farm (SRW01) Located on the Outer Continental Shelf Block OCS-A 487, and Offshore New York. Appendix R. Sunrise Wind Farm Construction and Operations Plan	R. Christopher Goodwin & Associates, Inc. (RCG&A) performed a marine archaeological resources assessment (MARA) of the submerged portions of the Preliminary Area of Potential Effect (PAPE). The MARA utilized geotechnical and high-resolution geophysical data collected by Fugro USA Marine, Inc. and Gardline during survey campaigns from 2019 to 2021. The MARA also included a review of shipwreck databases and previous surveys. The analysis was conducted to identify potential marine archaeological resources that might be impacted by the Project.	Eight potential shipwreck sites, and 43 buried paleolandscape features within the SRWEC and SRWF APE were identified and were recommended for avoidance by the Project.

Portion of APE	Report	Description	Key Findings/Recommendations
Onshore	Sunrise Wind Farm Project: Phase IA Archaeological Survey, Sunrise Wind Onshore Facilities. Appendix S-1. Sunrise Wind Farm Construction and Operations Plan	Phase IA archaeological survey to determine whether previously identified terrestrial archaeological resources were located in the terrestrial archaeology PAPE, and to evaluate the potential for previously unidentified terrestrial archaeological resources to be located within the PAPE.	Phase I terrestrial archaeological survey identified a single archaeological site (EDR-SRW-001). This archaeological site was identified in an off-route variation of the onshore cable corridor that has since been removed from the APE. The site will therefore not be impacted by the Project.
	Sunrise Wind Farm Project: Phase IB Archaeological Survey, Sunrise Wind Onshore Facilities. Appendix S-2. Sunrise Wind Farm Construction and Operations Plan	Phase IB Archaeological Survey was to determine the presence or absence of previously unidentified terrestrial archaeological resources located within the Project's PAPE through infield investigations.	
	Sunrise Wind Farm Project: Laydown Area Addendum	Phase IB archaeological survey of two temporary laydown yards will support construction activities, including the Northville Laydown Yard (2 acres) and the Zorn Laydown Yard (12.5 acres)	Phase I terrestrial archaeological investigations did not identify any cultural resources within the two proposed laydown yard areas.
Visual	Sunrise Wind Farm Project: Appendix T, Historic Resources Visual Effects Assessment. Report prepared for Sunrise Wind by Environmental Design & Research. Appendix T, Sunrise Wind Farm Construction and Operations Plan	Report detailing desktop research conducted for the HRVEA for the WTGs and OCS-DC, which provided information for 307 previously identified above-ground historic resources within the PAPE for viewshed resources.	Identifies and evaluates 307 above ground historic properties within the PAPE. The assessment finds that potential adverse effects are possible concerning 47 above ground historic properties.
	Sunrise Wind Farm Project: Appendix U, Onshore Above-ground Historic Properties Report. Report prepared for Sunrise Wind by Environmental Design & Research. Appendix U, Sunrise Wind farm Construction and Operations Plan.	Report detailing field reconnaissance survey and viewshed analysis of the PAPE for the OnCS-DC.	

CONSULTATION AND COORDINATION WITH CONSULTING PARTIES AND THE PUBLIC

Early Coordination

Since 2010, BOEM has coordinated OCS renewable energy activities for the MA-RI WEAs with federally recognized Native American Tribes (Tribes) and its federal, state, and local government partners through its intergovernmental Renewable Energy Task Force. From 2010 onward, BOEM has met regularly with Tribes that may be affected by renewable energy activities in the area, specifically during planning for the issuance of leases and review of site assessment activities. BOEM also hosts public information meetings to update interested stakeholders on major renewable energy milestone. Information on BOEM's Renewable Energy Task Force meetings is available at https://www.boem.gov/renewable-energy/state-activities/new-york-activities.

National Environmental Policy Act Scoping and Public Hearings

On August 31, 2021, BOEM announced its notice of intent (NOI) to prepare an EIS for the SRWF COP (BOEM 2021). This NOI was revised on September 3, 2021 to allow for the comment period to extend to October 4, 2021, and to make technical corrections. The purpose of the NOI was to solicit input on issues and potential alternatives for considerations in the EIS. Throughout the scoping process, Tribes; federal agencies; state and local governments; other interested parties; and the public had the opportunity to aid BOEM in determining significant resources and issues, impact-producing factors (IPFs), reasonable alternatives, and potential mitigation measures to be analyzed in the EIS as well as provide additional information.

BOEM elected to use the NEPA substitution process to allow for public involvement in the NHPA Section 106 consultation pursuant to 36 CFR 800.8(c)). Through this notice, BOEM announced that it would inform its NHPA Section 106 consultation through the NEPA commenting process and invited public comment and input regarding the identification of historic properties or potential effects to historic properties from activities associated with the undertaking.

BOEM held virtual public scoping meetings, which included specific opportunities for engaging on issues relative to NHPA Section 106 review for this undertaking, on September 16th, 20th, and 22nd of 2021. Through this NEPA scoping process, BOEM received comments related to cultural, historic, archaeological, or tribal resources. Comments indicated that the EIS should assess potential onshore impacts to archaeological and historic resources at Project locations in NY. BOEM's EIS scoping report includes these comments and is available at https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-draft-environmental-impact-statement-deis-commercial.

On December 16, 2022, BOEM published a notice of availability for the NEPA draft EIS. As part of this process, BOEM held virtual public meetings on three dates in 2023:

- January 18, 2023; 5:00 PM
- January 19, 2023; 5:00 PM
- January 23, 2023; 1:00 PM

Each of these public meetings was held virtually. The public and consulting parties were invited to attend the meetings and were able to provide comments on the DEIS until the comment period closed on February 14, 2023. BOEM considered these comments received during scoping and on the draft EIS.

National Historic Preservation Act Section 106 Consultation

BOEM extended invitations to consult under NHPA Section 106 via letter on August 4, 2021 to 149 consulting parties. As third-party consultant to BOEM, SEARCH followed up with these parties to confirm preferred points of contact and interest in participating. The organizations BOEM invited to consult are listed in **Table 7**.

Table 7. Parties Invited to Participate in NHPA Section 106 Consultation.

Participants in the Section 106 Process	Invited Consulting Parties
SHPOs and State Agencies	Connecticut State Historic Preservation Office, Connecticut Department of Economic and Community Development
	Rhode Island Historical Preservation & Heritage Commission
	New York State Division for Historic Preservation
	Massachusetts Historical Commission
	Massachusetts Board of Underwater Archaeological Resources
	Massachusetts Commissioner on Indian Affairs
	Rhode Island Department of Environmental Management
Federal Agencies	ACHP
	BSEE
	NOAA
	USACE
	USCG
	USEPA
	USFWS
	National Park Service
	DASNE
	FAA
	USDOD

Participants in the Section 106 Process	Invited Consulting Parties
Federally Recognized Tribes	Mashpee Wampanoag Tribe
	Shinnecock Indian Nation
	Mashantucket (Western) Pequot Tribal Nation
	Wampanoag Tribe of Gay Head - Aquinnah
	Mohegan Tribe of Indians of Connecticut
	Narragansett Indian Tribe
	Delaware Tribe of Indians
	The Delaware Nation
Non-Federally Recognized Tribe	Chappaquiddick Tribe of Wampanoag Nation
	Unkechaug Nation
	The Golden Hill Paugussett
	Eastern Pequot Tribal Nation
	Schaghticoke Tribal Nation
Local Government	City of New Bedford
	City of Newport
	County of Barnstable (MA)
	County of Bristol (MA)
	County of Dukes (MA)
	County of Suffolk (NY)
	Town of Acushnet
	Town of Aquinnah
	Town of Bourne
	Town of Charlestown
	Town of Chilmark
	Town of Dartmouth
	Town of East Hampton
	Town of Edgartown
	Town of Exeter
	Town of Fairhaven
	Town of Falmouth
	Town of Gosnold
	Town of Jamestown
	Town of Little Compton
	Town of Middletown
	Town of Nantucket

Participants in the Section 106 Process	Invited Consulting Parties
	Nantucket Planning & Economic Development Commission (NP&EDC)
	Town of Narragansett
	Town of New Shoreham
	Town of North Kingstown
	Town of North Stonington
	Town of Oak Bluffs
	Town of Portsmouth
	Town of South Kingstown
	Town of Southold
	Town of Stonington
	Town of Tisbury
	Town of Tiverton
	Town of West Tisbury
	Town of West Warwick
	Town of Westerly
	Town of Westport
	Town of Brookhaven
	Cape Cod Commission
Certified Local Governments	Edgartown Historic Preservation Commission
	Acushnet Historical Commission
	North Kingstown Historic District Commission
	East Hampton Design Review Board
	Narragansett Historic District Commission
	Newport Historic District Commission
	South Kingstown Historic District Commission
	New Shoreham Historic District Commission
	Barnstable Historical Commission
	Bourne Historic Commission
	Chilmark Historical Commission
	Dartmouth Historical Commission
	Fairhaven Historical Commission
	Falmouth Historical Commission
Nongovernmental Organizations or Groups	Salve Regina University
	Norman Bird Sanctuary
	Montaukett Indian Nation

Participants in the Section 106 Process	Invited Consulting Parties
	Nantucket Historical Commission
	Nantucket Historic District Commission
	Gay Head Lighthouse Advisory Committee
	Southeast Lighthouse Foundation
	Block Island Historical Society
	Martha's Vineyard Commission
	Alliance to Protect Nantucket Sound
	Montauk Historical Society
	Preservation Massachusetts
	Bristol Historical and Preservation Society
	East Greenwich Historic Preservation Society
	The Preservation Society of Newport County (operate The Breakers, Marble House, etc.)
	Newport Historical Society
	Rhode Island Historical Society (operates The John Brown House Museum, Aldrich House, etc.)
	Newport Restoration Foundation
	Bellport-Brookhaven Historical Society
	Little Compton Historical Society
	Jamestown Historical Society
	Middletown Historical Society
	Portsmouth Historical Society
	Tiverton Historical Society
	Charlestown Historical Society
	Exeter Historical Association
	Narragansett Historical Society
	Westerly Historical Society
	Martha's Vineyard Museum
	Cuttyhunk Historical Society, Museum of the Elizabeth Islands, Massachusetts
	Nantucket Historical Association
	Nantucket Preservation Trust
	Stonington Historical Society
	New London County Historical Society
	Suffolk County Historical Society
	East Hampton Historical Society

Participants in the Section 106 Process	Invited Consulting Parties
	Southold Historical Museum
	Aquinnah Wampanoag Indian Museum
	The Barnstable Historical Society
	Falmouth Historical Society and Museums on the Green
	Dartmouth Historical and Arts Society
	Westport Historical Society
	New Bedford Historical Society
	Fairhaven Historical Society
	Long Plain Museum
	Bourne Historical Society
	Long Island Historical Societies
	Preservation Long Island
	Davis Town Meeting House Society Inc.

On June 10, 2022, BOEM contacted responsive governments and organizations listed in **Table 7**, providing information on the proposed undertaking, and re-extending the invitation to be a consulting party to the NHPA Section 106 review of the undertaking. The information provided to consulting parties beginning December 2022 included technical reports listed in that were prepared for historic property identification and presented as appendices to the COP. Fifty-eight entities that responded to BOEM's invitation or were subsequently made known to BOEM and added as participating consulting parties are listed in **Table 8**.

Table 8. Consulting Parties Participating in the NHPA Section 106 Consultation.

Participants in the Section 106 Process	Invited Consulting Parties That Participated in Consultation
SHPOs and State Agencies	Connecticut State Historic Preservation Office, Connecticut Department of Economic and Community Development
	Rhode Island Historical Preservation & Heritage Commission
	New York State Division for Historic Preservation
	Massachusetts Historical Commission
	Massachusetts Commissioner on Indian Affairs
	Rhode Island Department of Environmental Management
Federal Agencies	ACHP
	BSEE
	NOAA
	USACE
	USCG

Participants in the Section 106 Process	Invited Consulting Parties That Participated in Consultation
	USEPA
	USFWS
	National Park Service
	DASNE
	FAA
	USDOD
Federally Recognized Tribes	Mashpee Wampanoag Tribe
	Shinnecock Indian Nation
	Mashantucket (Western) Pequot Tribal Nation
	Wampanoag Tribe of Gay Head - Aquinnah
	Mohegan Tribe of Indians of Connecticut
	Narragansett Indian Tribe
	Delaware Tribe of Indians
	The Delaware Nation
Non-Federally Recognized Tribe	Unkechaug Nation
Local Government	City of Newport
	County of Dukes (MA)
	Town of Aquinnah
	Town of Bourne
	Town of Charlestown
	Town of East Hampton
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission (NP&EDC)
	Town of New Shoreham
	Town of North Stonington
	Town of Oak Bluffs
	Town of Brookhaven
Certified Local Governments	Newport Historic District Commission
	Barnstable Historical Commission
Nongovernmental Organizations or Groups	Salve Regina University
	Norman Bird Sanctuary
	Montaukett Indian Nation
	Nantucket Historical Commission

Participants in the Section 106 Process	Invited Consulting Parties That Participated in Consultation
	Nantucket Historic District Commission
	Gay Head Lighthouse Advisory Committee
	Southeast Lighthouse Foundation
	Block Island Historical Society
	Alliance to Protect Nantucket Sound
	Newport Restoration Foundation
	Narragansett Historical Society
	Nantucket Historical Association
	Nantucket Preservation Trust
	The Preservation Society of Newport County (operate The Breakers, Marble House, etc.)
	Long Island Historical Societies
	Preservation Long Island

Through multiple rounds of correspondence and consultation meetings, BOEM requested information from consulting parties on defining the APE and identifying historic properties potentially affected by the proposed undertaking.

BOEM held an initial NHPA Section 106 consultation meeting with consulting parties virtually on July 13, 2022. The meeting presented a project overview including maritime and terrestrial components, a review of NEPA/NHPA Section 106 substitution consultation and schedule procedures, and a description of Section 110(f) and its application to NHLs with regard to the project. During the discussion, Tribes inquired about the definition of the PAPE and the difference between an APE and PAPE, siting procedures and impacts to Ancient Submerged Landform Feature/s (ASLFs), avoidance measures, if ASLFs would be considered for inclusion as NHLs, and the difference in the level of scrutiny applied to NHLs under Section 110(f) and other historic properties subject to Section 106 consultation. Tribes expressed concern with lighting impacts, the inadequacy of data received to date for meaningful project review, and concern regarding the timing of consultation was raised. The Tribes expressed that consultation regarding project siting should be undertaken before selecting component locations.

In December 2022, the CHRVEA was distributed to consulting parties alongside a letter delineating the initial APE, updated versions of the historic resources visual effects assessment (HRVEA), terrestrial archaeological resources assessment (TARA) and marine archaeological resources assessment (MARA).

BOEM held the second NHPA Section 106 consultation meeting with consulting parties virtually on January 26, 2023. The meeting included review of the Project Review, Area of

Potential Effects Delineation, Technical Reports for Historic Properties Identification and Effects Assessment, and a Q&A and discussion session.

Based on feedback from consulting parties, in June 2023 BOEM decided to invite landowners of historic properties (including those within locally registered and/or NRHP listed historic districts) within the APE that were determined to be adversely affected by the undertaking to participate in the NHPA Section 106 review as consulting parties. Letter invitations were sent to 1,630 individual landowners on June 9, 2023 inviting them to participate in the review. The list of invited landowners can be provided by BOEM upon request.

BOEM shared the final Finding of Adverse Effect with consulting parties prior to a NHPA Section 106 meeting to be held in November 2023. During this meeting BOEM will review the information contained within this Finding and discuss the next steps for resolving adverse effects with consulting parties. A meeting summary and access to a recording of the meeting will be made available.

BOEM plans to continue consulting with the Tribes, SHPOs, ACHP, federal and state agencies, and the consulting parties to seek their comments and input regarding the effects of the undertaking on historic properties and the resolution of adverse effects, including the development and implementation of a memorandum of agreement (MOA).

GOVERNMENT-TO-GOVERNMENT CONSULTATIONS WITH FEDERALLY RECOGNIZED TRIBES/TRIBAL NATIONS

During preparation of the EIS and the NHPA Section 106 review, BOEM has held government-to-government meetings with Tribes. Multiple BOEM actions, including the Project and efforts of the Project on historic properties under NHPA Section 106, were discussed during these government-to-government meetings (see EIS Appendix A entitled *Required Environmental Permits and Consultations*). BOEM continues to consult with these and other Tribes on developments in offshore wind and the Project.

On October 15, 2021, BOEM held a government-to-government meeting on the Sunrise Wind Project with the Mashantucket Pequot Tribal Nation, the Mashpee Wampanoag Tribe, the Delaware Nation, the Shinnecock Nation, and the Wampanoag Tribe of Gay Head (Aquinnah). The meeting discussion included a review of the project, site characteristic studies, and required field surveys. Tribes requested additional photography in different seasons, asked for further information on specific construction methods and materials, potential environmental impacts, and cumulative visual impacts. Additionally, Tribes expressed an inability to facilitate a FAST-41 schedule, in general, due to the complexity and number of the projects being implemented simultaneously under their review.

In April 2023, the Bureau of Ocean Energy Management's (BOEM) Director, Liz Klein, and other BOEM leaders met with leaders from federally recognized Tribal Nations at the Tribal

Leaders Summit at Mohegan Sun in Montville, CT. The following Tribes' leaders and representatives participated in this two-day meeting (listed in alphabetical order): Houlton Band of Maliseet Indians; Mashantucket (Western) Pequot Tribal Nation; Mashpee Wampanoag Tribe; Narragansett Indian Tribe; Passamaquoddy Tribe, Indian Township; Passamaquoddy Tribe, Pleasant Point; Penobscot Indian Nation; Shinnecock Indian Nation; and Wampanoag Tribe of Gay Head (Aquinnah). The discussions centered on BOEM's renewable energy program and concerns about offshore wind development on the east coast, including the call from Tribal Nations for a moratorium on offshore wind energy development. BOEM shared with the Tribal Nations its continued commitment to upholding its Tribal trust responsibilities and fostering working relationships based on trust and meaningful consultation. BOEM confirmed that the agency is working to improve the consultation process to engage Tribes in a respectful way and to help Tribal Nations expand capacity to engage in environmental reviews and Section 106 consultations. During this meeting, BOEM reiterated its commitment to engage with Tribal Nations at all phases of offshore wind energy development and to ensure that the identification of historic properties and resolution of adverse effects incorporate Indigenous Knowledge and Tribal perspectives through the Section 106 consultation.

Lessee Tribal Nation Contact/Communication

Sunrise Wind LLC has conducted communications with select Tribes outside of Section 106 consultation, to include coordination for Tribal monitoring of onshore construction activities undertaken from July 2023 onward. BOEM did not participate in this communication but received notification that it had been conducted by the Lessee.

APPLICATION OF THE CRITERIA OF ADVERSE EFFECT

The Criteria of Adverse Effect under NHPA Section 106 (36 CFR 800.5(a)(1)) states that an undertaking has an adverse effect on a historic property when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later, be farther removed in distance, or be cumulative (36 CFR 800.5(a)(1)). According to the regulations (36 CFR 800.5(a)(2)), adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property;
- alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access that is not consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68) and applicable guidelines;
- removal of the property from its historic location;
- change of the character of the property's use or physical features within the property's setting that contribute to its historical significance;
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to a Tribe or Native Hawaiian organization; and
- transfer, lease, or sale of a property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure the long-term preservation of the property's historical significance.

ADVERSELY AFFECTED HISTORIC PROPERTIES

BOEM has determined that the undertaking would have an adverse effect on the following 47 historic properties within the visual APE:

Town of Aquinnah, Massachusetts:

- Gay Head Light (NRHP Listed Resource)
- Gay Head – Aquinnah Shops Area (MHC Historic Inventory Site)
- Vanderhoop, Edwin DeVries Homestead (NRHP Listed Resource)
- Cooper, Tom House (MHC Historic Inventory Site)
- Gay Head – Aquinnah Coast Guard Station Barracks (MHC Historic Inventory Site)
- Haskins, Theodore House (MHC Historic Inventory Site)
- Gay Head – Aquinnah Town Center Historic District (NRHP-Listed Resource)
- 3 Windy Hill Drive (MHC Historic Inventory Site)

- 71 Moshup Trail (MHC Historic Inventory Site)
- Vanderhoop, Leonard House (MHC Inventory Site)
- Vineyard Sound and Moshup's Bridge (NRHP-eligible TCP)

Town of Chilmark, Massachusetts:

- Hancock, Capt. Samuel – Mitchell, Capt. West House (NRHP-Eligible Resource)
- Flanders, Ernest House, Shop and Barn (MHC Historic Inventory Site)
- Hancock, Russell House (MHC Historic Inventory Site)
- Mayhew, Simon House (MHC Historic Inventory Site)
- Flaghole (MHC Historic Inventory Site)

Town of Edgartown, Massachusetts:

- Chappaquiddick Island TCP (NRHP-Eligible TCP)

Town of West Tisbury, Massachusetts:

- Scrubby Neck Schoolhouse (MHC Historic Inventory Site)

Town of Narragansett, Rhode Island:

- Point Judith Lighthouse (NRHP-Listed Resource)

City of Newport, Rhode Island

- Bellevue Avenue Historic District (NHL)
- Ocean Drive Historic District (NHL)
- The Breakers (NHL)

Town of New Shoreham, Rhode Island:

- Block Island North Light (NRHP-Listed Resource)
- Corn Neck Road (NRHP-Eligible Resource)
- Hippocampus/Boy's Camp/Beane Family (NRHP-Eligible Resource)
- Mitchell Farm (NRHP-Eligible Resource)
- Champlin Farm (NRHP-Eligible Resource)
- Indian Head Neck Road (NRHP-Eligible Resource)
- Island Cemetery/Old Burial Ground (RI Historical Cemetery)
- Beach Avenue (RI Historical Cemetery)
- Old Harbor Historic District (NRHP-Listed Resource)
- Beacon Hill (NRHP-Eligible Resource)
- Spring House Hotel (NRHP-Eligible Resource)
- Spring House Hotel Cottage (NRHP-Eligible Resource)
- Capt. Welcome Dodge Sr. House (NRHP-Eligible Resource)
- Spring Street (NRHP-Eligible Resource)
- Caleb W. Dodge Jr. House (NRHP-Eligible Resource)
- WWII Lookout Tower – Spring Street (NRHP-Eligible Resource)

- Pilot Hill Road and Seaweed Lane (NRHP-Eligible Resource)
- WWII Lookout Tower at Sands Pond (NRHP-Eligible Resource)
- Lewis-Dickens Farm (NRHP-Eligible Resource)
- Block Island Southeast Lighthouse Historic Landmark (National Historic Landmark [NHL])
- Miss Abby E. Vaill/1 of 2 Vaill Cottages (NRHP-Eligible Resource)
- Hon. Julius Deming Perkins/Bayberry Lodge (NRHP-Eligible Resource)
- Mohegan Cottage/Evertt D. Barlow House (NRHP-Eligible Resource)
- Capt. Mark L. Potter House (NRHP-Eligible Resource)
- New Shoreham Historic District (Local Historic District)

Assessment of Effects on Historic Properties in the Visual Area of Potential Effects

BOEM has determined that the maritime setting of or the sea views from the 47 adversely affected historic properties are characteristics that contribute to each properties' NRHP eligibility. The introduction of SRWF offshore infrastructure into the maritime setting and sea views from these historic properties would diminish the integrity of the properties' setting and feeling. For historic properties where BOEM has determined the Project would cause adverse effects, BOEM then assessed the impact of the SRWF in the context of other reasonably foreseeable actions, which may result in cumulative effects (see SEARCH 2022).

To evaluate effects, the HRVEA reviewed the physical parameters of the wind farm and NRHP-qualifying characteristics of 307 historic properties[1] within the HRVEA's identified PAPE. The HRVEA found that the Project's proposed WTGs would "likely constitute a change in the physical environment" and further stated that this "is particularly true for above-ground historic properties for which open views of the ocean are integral" (EDR 2022:110). Of the 307 historic properties reviewed, no adverse effect is recommended for 260. Effects did not rise to the level of adverse for these properties either because ocean views were not integral to their NRHP eligibility or because distance, visual obstructions, or diminished integrity of the current setting meant that the introduction of Project infrastructure into property setting or views would not rise to the level of an adverse effect. In regard to effects to the historic setting of properties, the HRVEA notes that visual effects "may be mitigated by the presence of modern infrastructure which diminishes the existing integrity of setting, the presence of commercial shipping vessels on the ocean, and the effect of distance on visibility" (EDR 2022:111).

In total, the HRVEA reviewed visual effects to 307 historic properties, and the HRVEA analysis recommended that 47 of the 307 historic properties will experience visual adverse effects as a result of the Project. Due to the size and scale of the Project and the importance of maritime

[1] For the purposes of this Finding, historic properties are defined as resources listed on the NRHP, resources determined eligible for listing on the NRHP but not listed, resource potentially eligible for listing, or resources of undetermined NRHP eligibility that are assumed to be eligible for the purposes of this review.

setting and/or sea view to NRHP eligibility (or a combination of all three), BOEM determined that these 47 historic properties will be adversely affected by the Project and took into account all information and comments provided by consulting parties in correspondence and meetings to inform determinations of adverse effects, including visual and cumulative effects. BOEM determined that the undertaking would result in adverse effects to four NHLs, the Block Island Southeast Lighthouse, the Bellevue Avenue Historic District, The Breakers, and The Ocean Drive Historic District, of 47 adversely affected historic properties.

Historic properties with adverse effect recommendations are distributed across Massachusetts and Rhode Island. In Massachusetts, adversely effected historic properties are located in the Town of Aquinnah (11), the Town of Chilmark (5), the Town of Edgartown (1), and Town of West Tisbury (1). Of the 18 adversely affected historic properties in Massachusetts, 17 are between 20 miles and 29 miles (rounded to the nearest mile) of the nearest WTG. The Vineyard Sound and Moshup's Bridge TCP is the only one of these 18 properties to extend within less than 20 miles of the WTGs, as the property boundary includes areas of the Atlantic Ocean. At its closest, the TCP boundary is approximately 15 miles from the Project, where the boundary extends offshore of Nomans Land Island.

In Rhode Island, adversely affected properties are located in the Town of Narragansett (1), the City of Newport (3), and the Town of New Shoreham (25) in Rhode Island. Of the adversely affected properties in Rhode Island, four are on the mainland, while the remaining 25 are on Block Island. The four mainland properties are between 25 miles and 29 miles from the WTGs, while the Block Island properties are primarily between 16 miles and 20 miles of the closest WTG, with one property at a distance of 27 miles. Each of the 47 adversely affected historic properties is within 30 miles of potential SRWF WTG locations.

The EIS presents three action alternatives (including 5 variants to Alternative C) for the Project (Table 1). BOEM determined that, aside from the No Action alternative, those alternatives proposing the construction of fewer WTGs would reduce visual effects because fewer WTGs would be visible from the affected historic properties but none of the alternatives would reduce visual effects to the extent that would avoid visual adverse effects to the 47 historic properties. Nor would the alternatives increase visual effects to historic properties already identified as having no adverse effects from the Project. Thus the 47 same historic properties would remain adversely affected regardless of which EIS alternative is selected.

The cumulative effects analysis quantified the total number of WTGs from all reasonably foreseeable offshore wind projects that would be theoretically visible (daytime or nighttime) within the APE. This analysis assumed the development of eight additional wind farms within the theoretical limit of visibility: Bay State Wind (OCS-A 0500), Beacon Wind (OCS-A 0520), SouthCoast Wind (OCS-A 0521), New England Wind (OCS-A 0534), Revolution Wind (OCS-A 0486), South Fork Wind (OCS-A 0517), Vineyard Wind 1 (OCS-A 0501), and Vineyard Wind Northeast (OCS-A 0522), and would result in the construction and operation of 923 additional WTGs (SEARCH 2022). Upon the full conceptual build-out of all the additional WTG locations, the Project would comprise approximately 11.6% of the total visible WTGs.

If all other projects are constructed, direct views of the SRWF from mainland Rhode Island would be obscured by the Revolution Wind and Southfork Wind projects. The Revolution Wind project would similarly obscure the most direct views of SRWF from Massachusetts. Despite the construction of the other projects, Block Island would have unobstructed views of the SRWF, with SRWF representing the closest project to the southeastern portion of Block Island. In areas where SRWF will be theoretically visible but partially obscured by the intervening Revolution Wind and Southfork Wind WTGs, the Project's visual effects would be proportionately small. However, for areas of Block Island with unobstructed views of the SRWF, the Project's visual effects will be proportionately large when considering the visual effects of proposed area offshore wind projects.

BOEM has found that the Project would have adverse visual effects on 47 historic properties. BOEM has applied the Criteria of Adverse Effect and determined that the Project would have adverse visual effects that diminish the integrity of setting and feeling of these 47 of these historic properties. However, BOEM has determined that adverse visual effects from the Project would not disqualify any of the historic properties from NRHP eligibility. BOEM finds that the undertaking would not adversely affect 260 historic properties within the visual APE, because the properties' significance is not related to maritime setting or views to the sea or because of limited visibility of the Project.

Assessment of Effects on Historic Properties in the Marine APE

Marine archaeological investigations within the lease area and export cable corridor identified eight shipwrecks or potential shipwrecks and 43 potential ASLFs (Schmidt et al. 2022). The eight identified shipwrecks are located within the marine APE. SRWF has established a protective buffer extending 50 m beyond each conservatively delineated shipwreck and will avoid seabed-disturbing activities within this buffer during construction, operations, and decommissioning activities (Schmidt et al., 2022). BOEM has determined the protective buffer to be sufficient to avoid adverse effects and would require its implementation as a condition of approval if the COP is approved. As a result, there will be no effects on these potential historic properties.

ASLFs are locations that may contain preserved evidence of formerly terrestrial landscape features that have survived erosion during marine transgression. Although these landforms and features exhibit high archaeological potential, no evidence of human occupation associated with the ASLFs was identified in core samples taken during the submerged cultural resources investigation (Schmidt et al. 2022:106-126). These landforms and features may derive their significance from reasons other than their archaeological potential, such as their potential contribution to a broader culturally significant landscape.

Four of the forty-three potential ASLFs within the surveyed Lease Area (WEA_P-02-D, WEA_P-11, WEA_P-17, and WEA_P-22) lie within the horizontal and vertical limits of the lease area portion of the APE. SRWF has committed to avoiding these four ASLFs. Marine archaeological

investigations of the export cable corridor identified 13 ASLFs within the export cable corridor portion of the APE. SRWF has committed to routing the export cable to avoid cable installation impacts to these 13 ASLFs within the export cable portion of the APE. In addition, SRWF has committed to developing a vessel anchoring plan prior to construction to avoid potential anchoring impacts to ASLFs in the lease area and export cable corridor portions of the APE. As a result, the undertaking will result in no adverse effects to ASLF historic properties.

Assessment of Effects to Historic Properties in the Terrestrial APE

One archaeological site (EDR-SRW-001) was identified on a flat terrace within an off-route variation of the onshore cable corridor that has since been removed from the APE. The site consists of a medium density scatter of lithic material including a single core, debitage, and fire altered rock which is associated with Native American longstanding use of the area. All the site deposits were recorded within subsurface test pits identifying two loci showing distinct activity areas. No diagnostic artifacts were identified within the subsurface tests. The site has not been evaluated for its inclusion in the NRHP. The site is no longer located within the APE and therefore would be completely avoided by the proposed undertaking. No other cultural resources were identified within the Terrestrial APE. Therefore, BOEM finds no historic properties of this type affected.

ONSHORE CONSTRUCTION ACTIVITIES

In July 2023, Sunrise Wind, LLC informed BOEM that they intended to begin construction of the ONCS, the onshore interconnection cable, two construction laydown areas prior to completion of the SRWF COP NHPA Section 106 review. These activities began on July 17, 2023.

MEASURES TO AVOID, MINIMIZE, AND MITIGATE ADVERSE EFFECTS

Measures to avoid, minimize, and/or mitigate adverse effects to historic properties will be implemented through the execution of an MOA by BOEM, the required signatories, invited signatories and consulting parties to resolve adverse effects under Section 106 of the NHPA. Examples of avoidance include defining avoidance buffers around marine archaeological resources such as shipwrecks. Examples of minimization measures could include, but would not be limited to, the use of aircraft detection lighting systems – (ADLSs) to reduce the effect of nighttime lighting or the use of a mechanical cutter, mechanical plow, and/or jet plow to install cables to minimize the amount seabed impacts (BOEM 2022). Examples of mitigation measures could include additional investigations or other measures to collect more information to understand the historic and archaeological context of affected historic properties.

A post-review discovery plan, that SRWF would implement during Project construction, would be a requirement of the MOA (pursuant to 36 CFR 800.13) to ensure that new historic properties not previously identified, and impacts to unanticipated historic properties, are considered appropriately. The MOA would contain all measures identified to avoid, minimize, and mitigate adverse effects on historic properties from the Project. (Sunrise Wind 2022)

AVOIDANCE

The NHPA Section 106 review process requires BOEM to consult with consulting parties to seek ways to avoid, minimize, or mitigate the Project's adverse effects that would result from the undertaking. BOEM is approaching this process sequentially, beginning with avoidance. Avoidance of adverse effects is preferred and prioritized where practicable. Measures planned to date to avoid adverse effects consist of the following:

Marine Archaeological Properties

The Project design has been modified to avoid direct physical impacts from the construction, operation, and decommissioning of the SRWF to the 51 marine archaeological resources (43 ASLFs and 8 potential shipwrecks) within the SRWF APE. In addition, SRWF has committed to developing a vessel anchoring plan prior to construction to identify no-anchorage areas within the lease area and export cable portions of the marine APE to avoid documented historic properties. Due to the proximity of ASLFs ECR_P4-B and ECR_P5-C to the proposed SRWF export cable and WEA_P22 to WTG 205, BOEM has requested that Sunrise Wind provide documentation demonstrating that these features were not impacted during construction activities by providing as-laid cable and as-built WTG foundation maps with the horizontal and vertical APE depicted. BOEM may require a post-construction seafloor

inspection to identify possible impacts to these three ASLFs based on the as-built/as-laid map review.

Terrestrial Archaeological Properties

The Lessee has taken the following steps to avoid impacts to terrestrial archaeological properties:

- Onshore Facilities are primarily sited within previously disturbed and developed areas (e.g., roadways, ROWs, developed industrial/commercial areas) to the extent feasible, to minimize impacts to potential archaeological resources; and

In addition to these pre-construction measures, the Lessee has developed and will implement an archaeological Monitoring Plan and Post Review Discovery Plan (MPRDP) to address the potential for post-review discoveries during Project construction. If an unanticipated archaeological discovery is made during onshore construction activities, the MPRDP includes commitments to stop work and erect protective measures around the find and to notify BOEM, NY SHPO, and federally recognized Tribes, and procedures for expedited evaluation of NRHP eligibility in consultation with the consulting parties.

Based on independent engagement between the Lessee and Tribes with ancestral ties to the terrestrial APE, the Lessee is aware that portions of the terrestrial APE have the potential to contain buried resources of concern to the Tribes. To address these concerns, the Lessee will implement an archaeological and Tribal monitoring program for construction activities within specific sections of the APE:

- The Landfall and ICW Work Areas, and

- Two areas of the Onshore Transmission Cable including segments within Mastic Beach (hamlet of Brookhaven) and

- Construction areas on either side of the Carmans River.

Ground-disturbing activities in these sections of the APE will be monitored by a professional archaeologist with stop-work authority and monitor(s) from the Tribal Nations. As the proposed construction methods for this section of the buried cable system will entail a Horizontal Directional Drill (HDD), monitoring will be conducted for the entry and exit pits, temporary workspaces and any associated areas of ground disturbance where exposed soils are visible from the ground surface. The Lessee has invited representatives of the consulting Tribes to participate in the monitoring activity and will provide reasonable compensation and accommodations for participating Tribal Monitors. In the event of an unanticipated discovery during monitored construction activities, the Lessee will adhere to the notification procedures in the MPRDP.

Aboveground Historic Properties

To maintain avoidance of adverse effects to historic properties in the visual APE where BOEM determined no adverse effects or where no effects would occur, BOEM will require Sunrise Wind to ensure that Project structures are constructed within the design envelope, sizes, scale, locations, lighting prescriptions, and distances that were used by BOEM to inform the definition of the APE for the Project and for determining effects in this Finding of Effect.

MINIMIZATION

Minimization efforts would proceed to reduce the level of any unavoidable adverse effects. However, minimization cannot eliminate adverse effects, it can only reduce them. Measures planned to date to minimize adverse effects consist of the following:

Marine Archaeological Properties

- The Offshore Post-review discovery plan included in the MOA that would include stop-work and treatment procedures for cultural material encountered during Project installation.

Aboveground Historic Properties

- Uniform WTG design, speed, height, and rotor diameter to reduce visual contrast.
- Uniform spacing of 1 nm (1.85 km) to decrease visual clutter, consistent with spacing across the NY WEAs, aligning WTGs to allow for safe transit corridors.
- The option to reduce the number of constructed WTGs from a maximum proposed number of 102 to as few as 94 (Alternatives B, C-1, and C-2), 87 (Alternative C-3A), 84 (Alternative C-3B), or 80 (Alternative C-3C).
- Lighting and marking in compliance with BOEM's *Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development* (BOEM 2021b).
    - Consistent paint color RAL 9010 Pure White or RAL 7035 Light Grey to blend with background sea and skies.
    - Flashing lighting instead of steady lighting where practicable.
    - Use of ADLSs (subject to approval by the Federal Aviation Administration) to drastically limit the time in which WTG lights are on and visible from adversely affected properties (ADLS lighting would reduce the nighttime lighting to less than 1% of the time that standard aircraft warning lights would be lit, on average, during Project operation [BOEM 2021a]).

MITIGATION

The remaining adverse effects after all avoidance and minimization efforts are employed would persist in the long term and be permanent. Mitigation measures would not correct the diminished integrity of historic properties as a result of the Project. Resolutions of adverse effects from the Project might correct other impacts or threats to historic properties, such as through property preservation or rehabilitation measures. Other mitigation for diminished integrity would focus on replacing lost historic resource values with outcomes that are in the public interest, such as through developing products that convey the important history of the property. Potential mitigation of remaining unavoidable adverse effects to Aboveground Historic Properties are summarized in **Table 9**.

Table 9: Proposed Mitigation Measures to Resolve Adverse Effects to Above Ground Historic Properties

Adversely Effected Historic Property(s)	Proposed Mitigation
The Point Judith Lighthouse, Town of Narragansett, Rhode Island	• Cyclical Maintenance Plan
The Scrubby Neck Schoolhouse, Town of West Tisbury, Dukes County, Massachusetts	• Development of a NRHP Nomination Form
The Block Island Southeast Lighthouse, NHL, Town of New Shoreham, Washington County, Rhode Island	• Physical Restoration • Improvements to Parking Area, Entrance, and Surrounding Landscape
The Chappaquiddick Island Traditional Cultural Property	• Scholarships and Training for Tribal Resource Stewardship • Survey and Risk Assessment of Shoreline Cultural Sites
The Vineyard Sound & Moshup's Bridge Traditional Cultural Property, Dukes County, Massachusetts & Atlantic Outer Continental Shelf	• Scholarships and Training for Tribal Resource Stewardship • Funding for Habitat Restoration
Five Historic Properties, Town of Chilmark, Dukes County, Massachusetts	• Historic Stone Wall Survey and Preservation Plan
Twenty-Four Historic Properties, Town of New Shoreham, Washington County, Rhode Island.	• Coastal Resiliency Planning and Implementation
Ten Historic Properties Town of Aquinnah, Dukes County, Massachusetts	• Long-Term Preservation of the Edwin DeVries Vanderhoop Homestead and the Aquinnah Shops. • Rehabilitation of the Gay Head Lighthouse
Bellevue Avenue Historic District National Historic Landmark, City of Newport, Newport County, Rhode Island	• Energy Efficiency, Greenhouse Gas Reduction, and/or HVAC/Climate Control Planning Studies. • Cultural Landscape Studies. • Aesthetic Enhancements. • Historic American Landscape Studies (HALS) Documentation.
The Breakers National Historic Landmark, City of Newport, Newport County, Rhode Island	• The Breakers Landscape Revival Project.

Ocean Drive Historic District National Historic Landmark, City of Newport, Newport County, Rhode Island	• Planning, Conditions Assessment, or Feasibility Study for The Bells/The Reefs Property in Brenton State Park. • Cultural Landscape Studies. • Historic American Landscape Studies (HALS) Documentation

The NHPA Section 106 consultation process is ongoing for the SRWF Project and would culminate in the final MOA detailing measures to resolve adverse effects to historic properties, as agreed upon by the signatories, invited signatories, and consulting parties (pursuant to 36 CFR 800). BOEM would continue to consult in good faith with the consulting parties to resolve adverse effects.

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NATIONAL HISTORIC LANDMARKS AND THE NHPA SECTION 106 PROCESS

The National Park Service (NPS), which administers the National Historic Landmarks (NHL) program for the Secretary of the Interior (Secretary), describes NHLs and the requirements for NHLs as follows:

> National Historic Landmarks (NHL) are designated by the Secretary under the authority of the Historic Sites Act of 1935, which authorizes the Secretary to identify historic and archaeological sites, buildings, and objects which "possess exceptional value as commemorating or illustrating the history of the United States." Section 110(f) of the NHPA requires that Federal agencies exercise a higher standard of care when considering undertakings that may directly and adversely affect NHLs. The law requires that agencies, "to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark." In those cases when an agency's undertaking directly and adversely affects an NHL, or when Federal permits, licenses, grants, and other programs and projects under its jurisdiction or carried out by a state or local government pursuant to a Federal delegation or approval so affect an NHL, the agency should consider all prudent and feasible alternatives to avoid an adverse effect on the NHL (NPS 2021).

NHPA Section 110(f) applies specifically to NHLs. The implementing regulations for Section 106 of the NHPA detail special requirements for protecting NHLs, as required by NHPA Section 110(f). These special requirements found at 36 CFR 800.10, provide the following guidance to federal agencies to comply with Section 110(f) through the Section 106 process:

- Requires the agency official, to the maximum extent possible, to undertake such planning and actions as necessary to minimize harm to any NHL that may be directly and adversely affected by an undertaking.
- Requires the agency official to request the participation of the ACHP in any consultation conducted under 36 CFR 800.6 to resolve adverse effects to NHLs.
- Further directs the agency to notify the Secretary of any consultation involving an NHL and to invite the Secretary to participate in consultation where there may be an adverse effect.

BOEM has determined that ten NHLs are within the visual APE for the Project: Battle of Rhode Island Historic District, Bellevue Avenue Historic District, Block Island Southeast Lighthouse, Marble House, Montauk Point Lighthouse, Nantucket Historic District, New Bedford Historic District, Ocean Drive Historic District, The Breakers, and William Watts Sherman House. BOEM is acting to avoid adverse effects on NHLs, in accordance with NHPA 110(f) and the following the Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation

Programs Pursuant to the NHPA (NPS 2023). BOEM has determined that six of the ten NHLs within the visual APE will not be adversely affected by the Project: the Battle of Rhode Island Historic District, Marble House, Montauk Point Lighthouse, Nantucket Historic District, New Bedford Historic District, and William Watts Sherman House. Avoidance of adverse effects to these NHLs would be achieved through multiple existing environmental conditions that serve to obscure the Project from view of these six NHLs, including distance to the Project, curvature of the earth and natural topography, intervening buildings and vegetation, and environmental factors such as fog, sea spray, and other typical atmospheric conditions.

BOEM has determined that four of the ten NHLs in the visual APE will be adversely affected by the Project: the Bellevue Avenue Historic District, the Ocean Drive Historic District, The Breakers, and the Block Island Southeast Lighthouse Historic Landmark. BOEM invited the NPS (as delegated by the Secretary) and ACHP to be consulting parties with the initiation of NHPA Section 106 process on the Project. BOEM notified the NPS and ACHP of the adversely affected NHLs with the distribution of this Finding. The NPS has accepted BOEM's invitation to consult. BOEM is fulfilling its responsibilities to give a higher level of consideration to minimizing harm, as required by NHPA Section 110(f), through the implementation of the special requirements outlined at 36 CFR 800.10.

BOEM considered prudent and feasible alternatives to avoid adverse effects on the four NHLs. As part of this consideration, BOEM applied the Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (NPS 1998, which states:

> Where such alternatives appear to require undue cost or to compromise the undertaking's goals and objectives, the agency must balance those goals and objectives with the intent of section 110(f). In doing so, the agency should consider: (1) the magnitude of the undertaking's harm to the historical, archaeological and cultural qualities of the NHL, (2) the public interest in the NHL and in the undertaking as proposed, and, (3) the effect a mitigation action would have on meeting the goals and objectives of the undertaking.

As prescribed by this directive, BOEM must balance an undertaking's harm to NHLs against actions that would make construction of the undertaking unfeasible. While a no-action alternative would negate all potential adverse effects to the four NHLs due to the Project, Executive Order 14008 (2021) directs federal agencies to utilize their full capacity to combat the climate crisis, a goal which is partially achieved through the construction of the Project. As described in Table 1 and the Assessment of Adverse Effects on Above-Ground Historic Properties above, BOEM considered three alternatives to the Proposed Action. Among these, Alternatives A is no action, while B and C (including C-1, C-2, C-3A, C-3B, and C-3C), considered removal of select WTG positions from development within the Lease Area for the purpose of to minimize impacts to fisheries habitats and constructability limits in the proposed project area that are the most vulnerable to long-term impacts in balance with the undertaking's goals and objectives.

While the WTGs identified for removal under the proposed Alternatives B and C could lessen the visual impact of the Project on the four adversely affected NHLs, the overall visual impact would still result in an adverse effect on these particular NHLs.

BOEM has planned and is taking action to minimize this harm, as required by NHPA Section 110(f) at 36 CFR 800.10, to the four NHLs. Descriptions of actions to minimize or mitigate adverse effects are summarized in this Finding of Effect and are discussed in greater detail in the Memorandum of Agreement. Actions to minimize visual adverse effects include using consistent nonreflective white and light gray paint on offshore structures (i.e., WTGs and OSS) and using navigational lighting that minimizes the visibility of the WTGs and OSS. Measures to mitigate adverse effects on NHLs may include activities identified through consultation. Implementation of a mitigation measure to resolve visual adverse effects on the four NHLs, including the Bellevue Avenue Historic District, the Ocean Drive Historic District, The Breakers, and the Block Island Southeast Lighthouse Historic Landmark, would be consistent with the nature, scope, size, and magnitude of visual impacts, including cumulative visual impacts, caused by the undertaking.

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REFERENCES CITED

Bureau of Ocean Energy Management (BOEM). 2022. Environmental Impact Statement for the Sunrise Wind Project. December. Washington, D.C.: U.S. Department of the Interior, Bureau of Ocean Energy Management.

The White House. 2021. Executive Order 14008: Tackling the Climate Crisis at Home and Abroad; January 27, 2021. Code of Federal Regulations (2021), https://www.govinfo.gov/content/pkg/DCPD-202100095/pdf/DCPD-202100095.pdf, accessed August 19, 2023.

National Park Service (NPS). 1998. The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act; 63 FR 20495-2058; April 27, 1998. Available at: https://www.govinfo.gov/content/pkg/FR-1998-04-24/pdf/98-10972.pdf. Accessed August 19, 2023.

National Park Service (NPS). 2023. Section 110 of the National Historic Preservation Act. Available at: https://www.nps.gov/fpi/Section110.html, Accessed August 19, 2023.

Schmidt, James S., Chiarel, Shannon M., McLellan, Tyler, Himmelstein, Ashley, Williams, Martha, and Goodwin, R. Christopher. 2022. Phase I Marine Archaeological Resources Assessment for the Sunrise Offshore Wind Farm (SRW01) Located on the Outer Continental Shelf Block OCS-A 0487, and Offshore New York. Prepared for Sunrise Wind, LLC.

Sunrise Wind. 2022. Cultural Resources Avoidance, Minimization, and Mitigation Measures. Revision 3, August 19, 2022.

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APPENDIX A:

AREA OF POTENTIAL EFFECTS MAP FIGURES

APPENDIX B:

MAP FIGURES OF HISTORIC PROPERTIES IN RELATION TO THE APE (DETACHED – CONFIDENTIAL)

APPENDIX C:

CORRESPONDENCE ON ONSHORE CONSTRUCTION ACTIVITIES

August 14, 2023

Karen J. Baker, Chief
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
1849 C Street, NW
Washington, D.C. 20240

Ref: *Sunrise Wind Project*
Connecticut, Massachusetts, New York, & Rhode Island
ACHP Project Number: 016001

Dear Ms. Baker:

On August 7, 2023, the Advisory Council on Historic Preservation (ACHP) received a notification from the Bureau of Ocean Energy Management (BOEM) regarding onshore construction work planned and underway by Sunrise Wind, LLC, the applicant seeking a Construction and Operation Plan (COP) approval from BOEM to construct, operate and maintain an offshore wind farm (Sunrise Wind Project) approximately 18.5 statute miles (mi) south of Martha's Vineyard, Massachusetts, and approximately 30 mi east of Montauk, New York. BOEM initiated review under Section 106 of the National Historic Preservation Act for the proposed Sunrise Wind Project on September 13, 2021 and anticipates seeking execution of a Memorandum of Agreement (MOA) to resolve the adverse effects of the undertaking in the early fall of this year, pursuant to 36 CFR §800.6(c) of the regulations implementing Section 106, 36 CFR Part 800. In its notice to the ACHP, BOEM indicated that Sunrise Wind intends to or has commenced with multiple onshore activities as part of Phase 1A and Phase 1B that would provide for the necessary electrical connection of the wind farm to the onshore substation once completed. There is no dispute among the parties that the onshore activities (i.e., Phase 1A and Phase 1B) are part of the undertaking subject to Section 106 review in this case. The undertaking for Section 106 purposes includes those aspects of a project without which the specifically approved activity would not serve a rational need.

Based on the information provided, the ACHP is concerned that the applicant is moving forward with construction activities that are part of the proposed undertaking prior to completion of the Section 106 review. The Section 106 regulations require the review process to begin early in project planning so that a broad range of alternatives may be considered to avoid, minimize, or mitigate potential adverse effects to historic properties. When portions of the undertaking begin ahead of the review process, the agency and consulting parties are left without the ability to meaningfully consult on alternatives and the ACHP's ability to comment on the potential effects to historic properties may be foreclosed. BOEM has stated that it has limited jurisdiction to control the actions of the applicant in this situation; however, the agency intends to continue and complete the Section 106 review as expeditiously as possible. Further, BOEM has informed the applicant of the risks of its actions in this case in light of the required federal review process.

The ACHP recommends that BOEM continue to advise the applicant of the need to complete the Section 106 review for the undertaking before work proceeding. The ACHP also recommends that BOEM engage consulting parties as soon as possible, share all relevant and timely information including information

related to the construction onshore, and work to address the potential effects to historic properties that may result from this undertaking in entirety. The ACHP remains committed to consulting with BOEM, the applicant, and other consulting parties to develop and finalize an MOA.

Furthermore, because the Sunrise Wind Project is being reviewed under Title 41 of the Fixing America's Surface Transportation Act (FAST-41), the ACHP is concerned by what appears to be a communication breakdown regarding the interdependent portions of this undertaking, which resulted in a separate effect finding for just the onshore activities being submitted by the applicant to the New York State Historic Preservation Office. We encourage BOEM, in conjunction with the Permitting Council, to assess how information about the entirety of the project should be presented and reviewed to avoid such misunderstandings in the future.

The ACHP intends to continue working with BOEM and wind farm applicants to help ensure an efficient and appropriate Section 106 review process for offshore wind development. We appreciate your consideration of our comments and recommendations on these issues and look forward to your response regarding how BOEM and the applicant intend to proceed in this case. Should you have any questions or require additional assistance, please contact Mr. Christopher Daniel at (202) 517-0223 or by e-mail at cdaniel@achp.gov and reference the ACHP Project Number above.

Sincerely,

Christopher Koeppel
Director, Acting
Office of Federal Agency Programs

United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

Dear Section 106 Consulting Parties for the Sunrise Wind Project,

On September 1, 2020, the Bureau of Ocean Energy Management (BOEM) received a Construction and Operation Plan (COP) from Sunrise Wind, LLC for commercial wind lease OCS-A 0487. Sunrise Wind LLC (Sunrise Wind) proposes to construct, operate and maintain an offshore wind farm to be located approximately 18.5 statute miles (mi) (16.1 nautical miles [nm], 29.8 kilometers [km]) south of Martha's Vineyard, Massachusetts, and approximately 30 mi (26.1 nm, 48.2 km) east of Montauk, New York (NY).

Most of the Project's offshore components would be in federal waters in the designated BOEM Renewable Energy Lease Area OCS-A 0487 (Lease Area), which is in Outer Continental Shelf (OCS) blocks that were previously designated as Lease OCS-A 0487 in the Rhode Island/Massachusetts Wind Energy Area and Lease OCS-A 0500 in the Massachusetts Wind Energy Area. The Lease Area is approximately 30 statute miles (mi) east off the coast of Montauk, New York. Other components of the Project would be in New York state waters and onshore in Brookhaven, Long Island, New York. The proposed interconnection location for the Project is at the existing Holbrook Substation or the Holbrook and West Bus Substations, which are owned and operated by the Long Island Power Authority (LIPA).

On June 26, 2023 BOEM received Sunrise Wind's Notice of Intent to Commence Construction for "New York State Public Service Commission PSC Case 20-T-1617." BOEM acknowledges receiving information related to the commencement of Sunrise Wind's EM&CP Phase 1A activities (i.e., at the Onshore Converter and laydown yards), which were scheduled to commence on or about July 10, 2023, and Phase 1B activities (i.e., installation of splice vaults and duct banks, and the expansion of an existing substation), which are scheduled to commence on or around September 2023.

BOEM does not have authority over New York State Department of Public Service permitted activities. However, BOEM has a responsibility to analyze impacts from all of the proposed onshore activities included within the scope of a project as connected actions under the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA). BOEM intends to incorporate consideration of all the Phase 1 activities that Sunrise Wind wishes to commence prior to completion of the NEPA and Section 106 consultations into the ongoing analyses. BOEM has requested Sunrise Wind to update their COP to include these Phase 1a and Phase 1b activities, as presented in the approved New York State Environmental Management & Compliance Plan (EMCP) and include anticipated construction start and completion dates.

Moving forward, BOEM has informed Sunrise Wind that any onshore activities that begin prior to the completion of BOEM's NEPA and NHPA processes are at the Lessee's risk because BOEM will not make any decision on the COP until after the conclusion of those processes.

Moreover, BOEM recommends future projects do not commence onshore activities prior to the completion of the NEPA and NHPA process, since that is BOEM's preferred approach as it prevents potential delays in the permitting process by avoiding the need to revisit our analysis. As part of its obligations under NEPA and the NHPA for the Sunrise Wind COP, BOEM will revise the ongoing analyses to reflect the commencement of onshore construction activities.

BOEM plans to contact and notify our Section 106 Consulting Parties regarding Sunrise Wind's proposed early commencement of these onshore planned activities. Please Contact the Chief of Environmental Branch, Mrs. Jessica Stromberg, at Jessica.Stromberg@boem.gov or 703-787-1730 if you have any questions or concerns.

Sincerely,

Karen J. Baker
Chief
Office of Renewable Energy Programs

CC:
Mr. John Stokely, Project Coordinator
Ms. Paige Foley, NEPA Coordinator
Mr. Sarah Stokely, Section 106 Team Lead
Ms. Jessica Stromberg, Chief, Environment Branch for Renewable Energy
Mr. Dave MacDuffee, Chief, Projects & Coordination Branch
Ms. Marilyn Sauls, Chief, Engineering & Technical Review Branch
Mr. David Diamond, Deputy Chief of Operations, Atlantic Outer Continental Shelf
Mr. Pedro Meléndez-Arreaga, Office of the Solicitor, Department of the Interior

APPENDIX D:

DRAFT MEMORANDUM OF AGREEMENT

Version sent to Section 106 Consulting Parties for review on November 3, 2023.

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE RHODE ISLAND STATE HISTORIC PRESERVATION OFFICER,
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER, THE CONNECTICUT STATE HISTORIC PRESERVATION OFFICER, SUNRISE WIND LLC, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

WHEREAS, the Bureau of Ocean Energy Management (BOEM) plans to authorize construction and operation of the Sunrise Wind Farm (SRWF or the Project), which consists of the SRWF Wind Energy Area (WEA) within Lease Area OCS-A 0487 and the Sunrise Wind Export Cable (SRWEC) connecting the WEA to proposed terrestrial components located in Brookhaven, New York, pursuant to Section 8(p)(1)(C) of the Outer Continental Shelf (OCS) Lands Act (43 U.S.C. 1337(p)(1)(C)), as amended by the Energy Policy Act of 2005 (Public Law No. 109-58) and in accordance with Renewable Energy Regulations at 30 Code of Federal Regulations (CFR) Part 585; and

WHEREAS, BOEM determined that the construction, operation, maintenance, and decommissioning of the Project constitutes an undertaking subject to Section 106 of the National Historic Preservation Act (NHPA), as amended (54 USC 306108), and its implementing regulations (36 CFR 800); and

WHEREAS, BOEM is considering whether to approve with conditions the Construction and Operations Plan (COP) submitted by Sunrise Wind, LLC (Sunrise; hereafter "the Lessee"); and

WHEREAS, BOEM determined that the construction, operation, maintenance, and decommissioning of the SRWF plan for up to 94 offshore Wind Turbine Generators (WTGs) and one offshore converter station (OCS-DC) at 102 possible locations, up to 180 statute miles (mi) (290 kilometers [km]) of inter-array cables (IAC), one OCS-DC, one DC SRWEC located within an up to 104.7-mi (168.5-km) long corridor, onshore transmission cable, a transition joint bay (TJB), concrete and/or direct buried joint bays and associated components, onshore interconnection cable, fiber optic cable co-located with the onshore transmission and onshore interconnection cables, and one onshore converter station (OnCS-DC), could potentially adversely affect historic properties as defined under 36 CFR 800.16(l); and

WHEREAS, BOEM is preparing an Environmental Impact Statement (EIS) for the Project pursuant to the National Environmental Policy Act (42 USC 4321 et seq.) (NEPA) and elected to use the NEPA substitution for its Section 106 consultation pursuant to 36 CFR 800.8(c); and

WHEREAS, throughout this document the term 'Tribal Nation,' has the same meaning as 'Indian Tribe,' as defined at 36 CFR 800.16(m); and

WHEREAS, BOEM recognizes its government-to-government obligation to consult with Tribal Nations that may attach religious and cultural significance to historic properties that may be affected by the proposed undertaking; in addition, BOEM will comply with the American Indian Religious Freedom Act (AIRFA), Native American Graves Protection and Repatriation Act (NAGPRA), Executive Orders 13007 and 13175, and the Memorandum of Understanding to Protect Sacred Sites (November 2021); and

WHEREAS, BOEM invited the following federally recognized Tribes to consult on this Project: Mashpee Wampanoag Tribe, Shinnecock Indian Nation, Mashantucket (Western) Pequot Tribal Nation,

Wampanoag Tribe of Gay Head – Aquinnah, Mohegan Tribe of Indians of Connecticut, Narragansett Indian Tribe, Delaware Tribe of Indians, and Delaware Nation; and

WHEREAS, the Mashpee Wampanoag Tribe, the Shinnecock Indian Nation, the Mashantucket (Western) Pequot Tribal Nation, and the Wampanoag Tribe of Gay Head – Aquinnah accepted BOEM's invitation to consult and pursuant to 36 CFR 800.6(c)(2)(ii) BOEM invited these Tribes to sign this MOA as invited signatories; and

WHEREAS, the Shinnecock Indian Nation, the Narragansett Indian Tribe, the Delaware Tribe of Indians, and the Delaware Nation accepted BOEM's invitation to consult and BOEM invited these Tribal Nations to sign this MOA as concurring parties; and

WHEREAS, BOEM acknowledges that Tribal Nations possess special expertise in assessing the NRHP eligibility of properties with tribal religious and cultural significance to the Tribe(s) pursuant to 36 CFR 800.4(c)(1); and

WHEREAS, the Wampanoag Tribe of Gay Head (Aquinnah) and the Mashpee Wampanoag Tribe have previously identified the Vineyard Sound and Moshup Bridge Traditional Cultural Property (TCP) as a sacred site; and

WHEREAS, BOEM notified in advance the Tribal Nations and the Tribal Historic Preservation Officers (THPOs), State Historic Preservation Officers (SHPOs) of Connecticut, Massachusetts, New York, and Rhode Island and the Advisory Council on Historic Preservation (ACHP) on August 31, 2021 of their decision to use NEPA substitution and followed the standards for developing environmental documents to comply with the Section 106 consultation for this Project pursuant to 36 CFR 800.8(c), and posted this decision in the Federal Register with BOEM's Notice of Intent to prepare an EIS for the Project on August 31, 2021; and

WHEREAS, in accordance with 36 CFR 800.3, BOEM invited Massachusetts SHPO, Rhode Island SHPO, Connecticut SHPO, and the New York SHPO to consult on the Project on August 31, 2021, and each SHPO accepted on or before September 14, 2021, or reserved the right to consult upon review of the Draft EIS; and

WHEREAS, in accordance with 36 CFR 800.3, BOEM invited ACHP to consult early on the Project on August 31, 2021; and

WHEREAS, BOEM notified and invited the Secretary of the Interior (SOI; represented by the National Park Service [NPS]) to consult regarding this Project pursuant to the Section 106 regulations, including consideration of the potential effects to the NHLs as required under NHPA Section 110(f) (54 USC 306107) and 36 CFR 800.10, the NPS accepted BOEM's invitation to consult, and BOEM invited the NPS to sign this MOA as a concurring party; and

WHEREAS, the Project is within a commercial lease area that was subject to previous NHPA Section 106 review by BOEM regarding the issuance of the commercial lease and approval of site assessment activities. Both Section 106 reviews for the lease issuance and the approval of the site assessment plan were conducted pursuant to the PA and concluded with No Historic Properties Affected for lease issuance on June 4, 2013, and site assessment approval on September 21, 2016 consistent with the Programmatic Agreement (PA) regarding the review of OCS renewable energy activities offshore Massachusetts and Rhode Island (*Programmatic Agreement Among The U.S. Department of the Interior, Bureau of Ocean Energy Management; the State Historic Preservation Officers of Massachusetts and*

Rhode Island; The Mashpee Wampanoag Tribe; the Narragansett Indian Tribe; the Wampanoag Tribe of Gay Head (Aquinnah); and the Advisory Council on Historic Preservation; Regarding the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island) and this PA expired on May 12, 2022; and

WHEREAS, consistent with 36 CFR 800.16(d) and BOEM's *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585* (May 27, 2020), BOEM defined the area of potential effects (APE) for the undertaking as the depth and breadth of the seabed potentially impacted by any bottom-disturbing activities, constituting the marine archaeological resources portion of the APE (marine APE); the depth and breadth of terrestrial areas potentially impacted by any ground disturbing activities, constituting the terrestrial archaeological resources portion of the APE (terrestrial APE); the viewshed from which offshore or onshore renewable energy structures would be visible, constituting the visual portion of the APE (visual APE); and any temporary or permanent construction or staging areas that may fall into any offshore or onshore portions of the APE (see Attachment 1 APE Maps); and

WHEREAS, BOEM identified ten National Historic Landmarks (NHL), three Traditional Cultural Properties (TCP), 59 (38 individual resources, 21 historic districts) National Register of Historic Places (NRHP)-listed properties, 57 (32 individual resources, 25 historic districts) NRHP-eligible properties, and 178 (143 individual resource, 35 historic districts) above ground cultural resources without formal designations or determinations of NRHP eligibility that are considered historic properties for the purposes of this Section 106 review; in the offshore Project components' portion of the visual APE; and

WHEREAS, BOEM identified one aboveground historic property within the onshore above-ground visual APE; and

WHEREAS, BOEM identified eight submerged historic properties and 43 ancient submerged landforms features (ASLFs) historic properties in the marine APE; and

WHEREAS, BOEM identified no historic properties in the terrestrial APE; and

WHEREAS, BOEM identified ten NHLs in the offshore Project components' portion of the visual APE, including Montauk Point Lighthouse, Nantucket Historic District, New Bedford Historic District, Block Island Southeast Lighthouse, Ocean Drive Historic District, Bellevue Avenue Historic District, William Watts Sherman House, The Breakers (Historic District), Marble House, and the Battle of Rhode Island Historic District; and

WHEREAS, BOEM determined there would be no visual adverse effect to six of the ten NHLs in the offshore visual APE, including Montauk Point Lighthouse, Nantucket Historic District, New Bedford Historic District, William Watts Sherman House, Marble House, and Battle of Rhode Island Historic District, because ocean views are not character-defining features of these historic properties or because of the limited visibility of the Project from the historic properties; and

WHEREAS, within the range of Project alternatives analyzed in the EIS, BOEM determined that four NHLs (Bellevue Avenue Historic District, Block Island Southeast Lighthouse, Ocean Drive Historic District, and The Breakers [Historic District), two TCPs (Chappaquiddick Island, and Vineyard Sound and Moshup's Bridge), six (four individual resources, two historic districts) NRHP-listed properties, 20 (12 individual resources, eight historic districts) NRHP-eligible properties, and 15 (13 individual resources, two historic districts) aboveground resources that may be considered historic properties would be subject to visual adverse effects from WTGs. No historic properties were identified in the terrestrial APE, and thus none are adversely affected with implementation of the undertaking; and

WHEREAS, BOEM determined that the implementation of project design and avoidance measures identified in this MOA will avoid adverse effects to one TCP, six NHLs, 53 NRHP-listed properties, 37 NRHP-eligible properties, and 163 aboveground resources that may be considered historic properties in the offshore visual APE, and one aboveground historic property within the onshore above-ground visual APE; and

WHEREAS, BOEM determined all of the ASLFs identified in the marine APE are eligible for the NRHP under Criteria A and D and determined, under each of the Project alternatives analyzed in the EIS, that the undertaking will not adversely affect these ASLFs; and

WHEREAS, BOEM determined the undertaking will not adversely affect historic properties identified in the marine APE; and

WHEREAS, under each of the Project alternatives analyzed in the EIS, BOEM determined the Project would visually adversely affect 18 properties in Massachusetts, including three NRHP-listed properties (the Gay Head Aquinnah Town Center Historic District, the Gay Head Light, and the Edwin DeVries Vanderhoop Homestead), two TCPs (Chappaquiddick Island, and Vineyard Sound and Moshup's Bridge), one NRHP-eligible, and 12 other aboveground historic properties. The adversely affected aboveground properties in Massachusetts are: Gay Head – Aquinnah Town Center Historic District (Aquinnah), Chappaquiddick Island TCP (Edgartown), Gay Head Light (Aquinnah), Gay Head – Aquinnah Shops Area (Aquinnah), Edwin DeVries Vanderhoop Homestead (Aquinnah), Tom Cooper House (Aquinnah), Gay Head – Aquinnah Coast Guard Station Barracks (Aquinnah), Theodore Haskins House (Aquinnah), 3 Windy Hill Drive (Aquinnah), 71 Moshup Trail (Aquinnah), Leonard Vanderhoop House (Aquinnah), Vineyard Sound and Moshup's Bridge TCP (Aquinnah), Capt. Samuel Hancock – Capt. West Mitchell House (Chilmark), Ernest Flanders House, Shop and Barn (Chilmark), Russell Hancock House (Chilmark), Simon Mayhew House (Chilmark), Flaghole (Chilmark), and Scrubby Neck Schoolhouse (West Tisbury); and

WHEREAS, under each of the Project alternatives analyzed in the EIS, BOEM determined the Project would visually adversely affect 29 historic properties in Rhode Island, including four NHLs (Bellevue Avenue Historic District, Block Island Southeast Lighthouse, Ocean Drive Historic District, and The Breakers [Historic District]), three NRHP-listed properties (the Old Harbor Historic District, the Point Judith Lighthouse, and the Block Island North Light), 19 NRHP-eligible properties, and three other aboveground historic properties. The adversely affected aboveground properties in Rhode Island are: Bellevue Avenue Historic District NHL (Newport), Ocean Drive Historic District NHL (Newport), The Breakers NHL (Newport), Block Island Southeast Lighthouse NHL (New Shoreham), Old Harbor Historic District (New Shoreham), New Shoreham Historic District (New Shoreham), Point Judith Lighthouse (Narragansett), Block Island North Light (New Shoreham), Corn Neck Road Historic District (New Shoreham), Hippocampus/Boy's Camp/Beane Family (New Shoreham), Mitchell Farm Historic District (New Shoreham), Champlin Farm Historic District (New Shoreham), Indian Head Neck Road Historic District (New Shoreham), Island Cemetery/Old Burial Ground (New Shoreham), Beach Avenue Historic District (New Shoreham), Beacon Hill Historic District (New Shoreham), Spring House Hotel (New Shoreham), Spring House Hotel Cottage (New Shoreham), Capt. Welcome Dodge Sr. House (New Shoreham), Spring Street Historic District (New Shoreham), Caleb W. Dodge Jr. House (New Shoreham), WWII Lookout Tower – Spring Street (New Shoreham), Pilot Hill Road and Seaweed Lane Historic District (New Shoreham), WWII Lookout Tower at Sands Pond (New Shoreham), Lewis-Dickens Farm Historic District (New Shoreham), Miss Abby E. Vaill/1 of 2 Vaill Cottages (New Shoreham), Hon. Julius Deming Perkins/Bayberry Lodge (New Shoreham), Mohegan Cottage/Everett D. Barlow (New Shoreham), and Capt. Mark L. Potter House (New Shoreham); and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), BOEM has notified the ACHP of its adverse effect determination with specified documentation, including adverse effects to the NHLs, pursuant to 36

CFR 800.10(b), and ACHP is consulting on the resolution of adverse effects to the historic properties pursuant to 36 CFR 800.6(a)(1)(iii) and 36 CFR 800.10(b), and ACHP accepted the invitation to consult via letter on February 14, 2023; and

WHEREAS, Connecticut SHPO, Massachusetts SHPO, New York SHPO, and the Rhode Island SHPO have concurred with BOEM's finding of adverse effect on [this will be updated after consultation has concluded on the Finding of Adverse Effect Report; and

WHEREAS, in accordance with 36 CFR 800.3, BOEM invited other federal agencies, state and local governments, and additional consulting parties with a demonstrated interest in the undertaking to participate in this consultation, the list of those accepting participation and declining to participate by either written response or no response to direct invitations are listed in Attachment 2; and

WHEREAS, pursuant to 36 CFR 800.6(c)(2)(iii), BOEM invited the Lessee to sign this MOA as an invited signatory because the Lessee is assuming a responsibility under the MOA to implement certain stipulations; and

WHEREAS, pursuant to Section 404 of the Clean Water Act (33 USC 1344) and Section 10 of the Rivers and Harbors Act (33 USC 403), Department of the Army permits will be required from the United States Army Corps of Engineers (USACE) for this Project for activities that result in the discharge of dredged or fill material into jurisdictional wetlands and/or other waters of the United States and occurring in or affecting navigable waters of the United States, BOEM invited USACE to consult; and

WHEREAS, the USACE designated BOEM as the Lead Federal Agency pursuant to 36 CFR 800.2(a)(2) to act on its behalf for purposes of compliance with Section 106 for this Project (in a letter dated August 31, 2021, BOEM invited the USACE to sign this MOA as a concurring party, and the USACE accepted the invitation to sign this MOA as a concurring party; and

WHEREAS, BOEM has consulted with the signatories, invited signatories, and consulting parties participating in the development of this MOA regarding the definition of the undertaking, the delineation of the APEs, the identification and evaluation of historic properties, the assessment of potential effects to the historic properties, and on measures to avoid, minimize, and mitigate adverse effects to historic properties; and

WHEREAS, BOEM has planned and is taking action to minimize harm to the maximum extent possible, as required by NHPA Section 110(f) at 36 CFR 800.10 to the four adversely affected NHLs in the visual APE, Bellevue Avenue Historic District, Ocean Drive Historic District, The Breakers, and the Block Island Southeast Lighthouse, as explained in BOEM's 2023 *Finding of Adverse Effect for the Sunrise Wind Farm* (hereafter, the Finding of Effect, and dated November 2023), this includes the planning and action that would be implemented for the NHLs by BOEM under this MOA, pursuant to 36 CFR 800.10 and NHPA Section 110(f); and

WHEREAS, pursuant to 36 CFR 800.6, BOEM has invited the consulting parties as listed in Attachment 2 to sign as concurring parties; however, the refusal of any consulting party to sign this MOA or otherwise concur does not invalidate or affect the effective date of this MOA, and consulting parties who choose not to sign this MOA will continue to receive information if requested and have an opportunity to participate in consultation as specified in this MOA; and **WHEREAS,** the signatories (required signatories and invited signatories) agree, consistent with 36 CFR 800.6(b)(2), that adverse effects will be resolved in the manner set forth in this MOA; and

WHEREAS, BOEM conducted consulting party meetings, on December 21, 2021, April 8, 2022, September 27, 2023, April 7, 2023, and November 6, 2023 [future meetings will be included here]; and

WHEREAS, BOEM sought and considered the views of the public regarding Section 106 for this Project through the NEPA process by holding virtual public scoping meetings when initiating the NEPA and NHPA Section 106 review on September 16, 20, and 22, 2021 and virtual public hearings related to the Draft EIS on January 18, 19, and 23, 2023; and

WHEREAS, BOEM made the first Draft MOA available to the public for review and comment from December 16, 2022, to February 14, 2023, and made an updated version of the Draft MOA available to the public, using BOEM's Project website, and BOEM did receive comments from the public; and

NOW, THEREFORE, BOEM, the Wampanoag Tribe of Gay Head – Aquinnah, Mashantucket (Western) Pequot Tribal Nation, the Mashpee Wampanoag Tribe, the Massachusetts SHPO, Rhode Island SHPO, Connecticut SHPO, New York SHPO, the Lessee, and the ACHP agree that the undertaking will be implemented in accordance with the following stipulations to consider the effect of the undertaking on historic properties.

STIPULATIONS

BOEM, with the assistance of the Lessee, will ensure that the following measures are carried out as conditions of its approval of the undertaking:

I. MEASURES TO AVOID ADVERSE EFFECTS TO IDENTIFIED HISTORIC PROPERTIES

A. Marine APE

1. BOEM will include the following avoidance measures for adverse effects within the marine APE as conditions of approval of the Sunrise COP:

    i. The Lessee will avoid the eight known (ECR01, ECR02, ECR03, ECR04, ECR05, ERC06, WEA01, WEA02) shipwreck or sunken craft sites and potentially significant debris fields previously identified during marine archaeological surveys by a distance of no less than 164 feet (50 meters) from the known extent of the resource for placement of Project structures and when conducting seafloor-disturbing activities.

    ii. The Lessee will avoid ASLFs previously identified during marine archaeological resource assessments for the Project and incorporated avoidance buffering into the mapped ASLF feature boundary, as mapped in the MARA (COP Appendix R). This avoidance will protect ASLFs, to the known extent of the ASLF, from the placement of Project structures and when conducting seafloor-disturbing activities. The Lessee will provide documentation demonstrating that these features were not impacted during construction activities by providing as-laid cable and as-built WTG foundation maps with the horizontal and vertical APE depicted.

2. BOEM will require a post-construction seafloor inspection to identify possible impacts to ASLFs based on the as-built/as-laid map review.

B. Visual APE

1. BOEM will include the following avoidance measures for adverse effects within the visual APE as conditions of approval of the Sunrise COP:

    i. To maintain avoidance of adverse effects to historic properties in the visual APE where BOEM determined no adverse effects or where no effects would occur, BOEM will require the Lessee to ensure Project structures are within the BOEM approved Project design envelope (PDE), sizes, scale, locations, lighting prescriptions, and distances that

were used by BOEM to inform the definition of the APE for the Project and for determining effects in the *Finding of Effect* (see the Construction & Operations Plan: Sunrise Wind Farm, September, 2023).

ii. This measure (Stipulation I.B.1) will avoid adverse effects to six of the ten NHLs in the visual APE (Montauk Point Lighthouse, Nantucket Historic District, New Bedford Historic District, William Watts Sherman House, Marble House, and Battle of Rhode Island Historic District), through the Project distance and lack of visibility resulting from BOEM conditions of approval for the COP and PDE specifications for sizes, scale, locations, lighting prescription for the Project.

C. Terrestrial APE

BOEM will require archaeological monitoring during construction at the Carmans River crossing and the Smith Point/Mastic Beach Area – South side of Sunrise Highway to the northern margins of the Intercoastal Waterway Work Area as a condition of approval for the Sunrise COP. Archaeological monitoring would reduce potential impacts on undiscovered archaeological resources to a minor level by preventing further physical impacts on the archaeological resources encountered during construction. If archaeological resources or human remains are identified during Project construction, operations, or decommissioning, the onsite construction supervisor would stop work immediately and follow the protocols outlined in the Sunrise Wind Unanticipated Discoveries Plan (Attachment 6). Any monitoring activities by Tribal Nations will use monitors acceptable to those Tribal Nations, as identified in consultation with Tribal Nations. Tribal monitors will be compensated for their participation and any monitoring activities including per diem and travel to and from the site(s).

II. MEASURES TO MINIMIZE ADVERSE EFFECTS TO IDENTIFIED HISTORIC PROPERTIES

A. **Visual APE**

1. BOEM has undertaken planning and actions to minimize visual adverse effects to historic properties in the visual APE, including minimizing harm to the four adversely affected NHLs (Bellevue Avenue Historic District, Block Island Southeast Lighthouse, Ocean Drive Historic District, and The Breakers [Historic District]). The minimization measures below will minimize visual adverse effects to all adversely affected aboveground historic properties in the visual APE and will minimize the undertaking's cumulative visual adverse effects, that would add to the potential visual adverse effects of other reasonably foreseeable offshore wind energy developments. BOEM will include these minimization measures for adverse effects within the visual APE as conditions of approval of the Sunrise COP:

i. The Lessee will use uniform WTG design, speed, height, and rotor diameter to reduce visual contrast and decrease visual clutter.

ii. The Lessee will use consistent spacing, as far apart as possible, with maximum spacing in the dominant trawl tow direction where feasible and with minimum spacing of no less than 1.0 NM (1.9 km) to decrease visual clutter, aligning WTGs to allow for safe transit corridors.

iii. BOEM and the Lessee will include an option to reduce the number of constructed WTGs from a maximum proposed number of 94 WTGs to as few as 80 WTGs among the action alternatives analyzed in the EIS for the Project.

iv. The Lessee will apply a consistent paint color to the WTGs no lighter than RAL 9010 pure white and no darker than RAL 7035 light gray to help reduce the potential visibility of the turbines against the horizon during daylight hours.

v. The Lessee will implement an aircraft detection lighting system (ADLS) to automatically activate lights when aircraft approach the wind farm and then return to darkness. The WTGs and OSS will be lit and marked in accordance with Federal Aviation Administration, and U.S. Coast Guard lighting standards and consistent with BOEM's *Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development* (April 28, 2021) to reduce light intrusion.

III. MEASURES TO MITIGATE ADVERSE EFFECTS TO IDENTIFIED HISTORIC PROPERTIES

A. Visual APE

1. BOEM will ensure the following mitigation measures to resolve the adverse effects to historic properties and to minimize harm to NHLs are required as conditions of approval of the Sunrise COP and are implemented by the Lessee, unless otherwise specified. Those forms of mitigation BOEM has determined effective for treating NHLs are also determined effective in treating other visually impacted historic properties. To mitigate visual and cumulative visual adverse effects to NHLs, TCPs, and other historic properties, BOEM will ensure the implementation of the mitigation measures described in this MOA and the HPTPs attached to this MOA. Where the integrity of historic properties would be diminished by the visual adverse effects and cumulative visual adverse effects of the project, the proposed mitigation measures serve to support other means of conveying the significance of the historic property and to minimize the harm to NHLs, including documentation, interpretation, and dissemination of information and property preservation planning and activities (including repair and stabilization). See Attachment 5 for proposed budgets for each mitigation effort, reflecting good faith estimates, based on the experience of qualified consultants with similar activities and comparable historic properties. Tasks associated with the mitigation of visual adverse effects can occur during and/or after Project construction. Mitigation measures under Section III-C must be completed within five years of MOA execution, unless another timeline is agreed upon by the SHPO within whose state the mitigation is being performed, and accepted by BOEM. Tasks may be completed simultaneously, as applicable. The Lessee will fund mitigation measures in accordance with Attachment 5 and pursuant to the following measures under Section III-C.

2. Traditional Cultural Properties (TCPs)

i. <u>The Vineyard Sound and Moshup's Bridge Traditional Cultural Property</u>. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: The Vineyard Sound & Moshup's Bridge Traditional Cultural Property, Dukes County, Massachusetts & Atlantic Outer Continental Shelf) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking:

a. Support for Improved Tribal Connections to Nomans Land Island

1) Sunrise Wind will support the identification of appropriate printed and/or digital media for interpretative exhibits; archival research on the history, development, and historical/cultural significance of Nomans Land Island; design and production of draft and final interpretive materials; and consultation, meetings, and discussions including the Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee Wampanoag on these matters.

2) Sunrise Wind will submit the RFP, consultant bids in response to the RFP, draft deliverables, and final deliverbales to the consulting Tribal Nations and MHC for review.

b. Scholarships and Training for Tribal Resource Stewardship

1) The Lessee will fund scholarships and fees for professional training or certification programs in the fields of Astronomy, Archaeology or Anthropology, Marine Sciences, Aquaculture, Marine Fisheries, Marine Construction, Native American Studies, Ethnohistory, History, Biology, Natural Resources, Environmental Studies, Renewable Energy, Science, Engineering, Mathematics, and Tribal Nations' self-determined related fields of interest as described in Attachment 4. See Attachment 4 for the process for Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee Wampanoag Tribe access to scholarship funds. Sunrise Wind will establish one escrow account in equal amounts for each Tribal Nation (two total).

2) Sunrise Wind will have the documentation prepared by professionals preference provided to members from the Tribes with associated professional expertise and not limited to academics and with demonstrated experience in education and training program management and fiscal reporting.

3) Sunrise Wind will deposit half of the stipulated funding into two escrow accounts (one of each Tribal Nation) within 120 calendar days of Sunrise Wind receiving a no objection to the complete Facility Design Report/Fabrication and Installation report. Within 1 year of the first payment, Sunrise Wind will place the remaining half into those escrow accounts. The escrowed funds shall be released for the sole purpose of implementation of the mitigation as set forth in this MOA, attachment 4, and attachment 5.

4) Sunrise Wind will submit the RFP, consultant bids in response to the RFP, executed contracts between the implementing party and selected consultants, draft Scholarship Program Proposal, and final Scholarship Program Proposal to the consulting Tribal Nations for review.

c. Coastal Resilience and Habitat Restoration

1) The Lessee will provide funding for planning and implementation of targeted efforts to mitigate future losses of character defining features and contributing resources for the TCP, support economically sustainable traditional shellfishing/finfishing and plant collection practices, and documentation

and/or recover of threatened elements of cultural sites associated with the TCP located in the TCP boundaries or located in Tribal Nations' culturally associated areas as described in Attachment 4.

2) Sunrise Wind will have the documentation prepared by professionals with preference provided to members from the Tribes with associated professional expertise and not limited to academics and with demonstrated experience in archaeology, habitat restoration, coastal resilience planning program management, tribal natural resources or environmental protection, and fiscal reporting, as appropriate to the specific funded activities. All archaeological surveys or other subsurface terrestrial investigations on any land owned or controlled by the Commonwealth of Massachusetts, its agencies or political subdivisions or on any historical or archeological landmarks or on any lands restricted by Massachusetts General Law (MGL) c. 184, § 31 will be conducted in accordance with MHC regulations (950 CMR 70).

3) Sunrise Wind will submit the RFP, consultant bids in response to the RFP, draft deliverables, and final deliverables to the consulting Tribal Nations and MHC for review. BOEM with the assistance of Revolution Wind will consult with the Tribal Nations on the selection of the consultant to complete this specific measure (Stipulation III.C.2.ii.c).

d. Cultural and Natural Resource Data Compilation

1) Sunrise Wind will provide the Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee Wampanoag Tribal Nations funding for each of these Tribal Nations to engage a Tribal representative, or a professional meeting the SOI's professional qualification standards (36 CFR 60), of their choice to perform systematic update of inventories for resource of interest and to draft Tribal cultural and natural context(s) for the interpretation of resources. The survey, context development, and interpretation of resources can include the incorporation of ITEK as applicable.

2) Funding levels will be in accordance with those outlined specific to this mitigation measure in Attachment 5 to the MOA. Sunrise Wind will deposit half of the stipulated funding in an escrow account within 120 calendar days of Sunrise Wind receiving a no objection to the complete Facility Design Report/Fabrication and Installation Report. Within 1 year of the first payment, Sunrise Wind will place the remaining half into that escrow account.

3) This measure will be fully implemented, to update inventories and draft the context(s) at Stipulation III.A.2.i.d(1), within five years after the MOA is executed, unless otherwise agreed upon among the Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee Wampanoag Tribal Nations, BOEM, and Sunrise Wind.

ii. <u>The Chappaquiddick Island Traditional Cultural Property</u>. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: The Chappaquiddick Island Traditional Cultural Property) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the

following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Scholarships and Training for historical Chappaquiddick Wampanoag Tribal Resource Stewardship

1) The Lessee will fund scholarships and fees for historical Chappaquiddick Wampanoag Tribe members enrolling in accredited colleges or professional/vocational training programs in the fields of Marine Sciences, Marine Construction, Aquaculture, Geophysics, Astronomy, Geology, History, Anthropology, Archaeology, Environmental Sciences, or Indigenous Studies. At the discretion of the historical Chappaquiddick Wampanoag Tribe, recipients of financial support funded through this measure may be required to perform a limited period of service in the tribal government offices related to their field of study or training. The purpose of this measure is to enhance the capacity of the historical Chappaquiddick Wampanoag Tribe to preserve the critical physical and cultural attributes of the TCP through training and education of Tribal members. The intended outcome of this measure is to sustain and enhance the Tribe's maritime traditions by supporting and strengthening the Tribe's capacity to protect and preserve the TCP and their constituent elements through education and professional development. Traditional stewardship activities, including finfishing, shellfishing, plant harvesting and tending, and respectful treatment of plant and animal communities that form critical elements of the TCP, will be enhanced through incorporation of professional and academic training with traditional knowledge.

2) The scope of work will consist of: 1) Development of selection criteria for qualified applicants to receive financial support for educational and training opportunities; 2) Development of specific accreditation requirements colleges or professional/vocational training programs to which qualified tribal members may enroll; 3) Establishment of the appropriate Tribal Council, Tribal Department of Education, or committees of such governing bodies or departments to select among applicants to the funding program; 4) Development of fiscal control measures and annual reporting standards for all disbursements; and 5) Development of a Scholarship Program Proposal for review by the Interested consulting parties prior to initial disbursements, with proposed administrative costs to compensate each Tribal government for administration of the program.

3) If a comparable scholarship program with consistent eligibility criteria has already been established by the historical Chappaquiddick Wampanoag Tribe, the Sunrise Wind mitigation funding for this measure may be applied to such pre-existing programs provided that the Lessee and BOEM agree. In that case, implementation of the scope of work will not be required.

b. Survey and Risk Assessment of Shoreline Cultural Sites

1) The Lessee will fund the documentation of existing conditions of cultural places and sites and the assessment of specific risks to such places posed by coastal erosion, storm surge, and other climate change related factors. The risk assessment will assist in prioritizing actions to preserve, recover, or adapt

those places and cultural practices that have sustained the historical Chappaquiddick Wampanoag Tribe identities since time immemorial that are at specific risk of loss or major alteration.

2) The scope of work will consist of: 1) Archival research, review of recently-compiled ethnographic document of the TCP, and consultation with the Tribe to prioritize at-risk coastal sites and places that contribute to the significance of the historic property; 2) Archival research of historical and contemporary forecasts of future environmental conditions with a focus on shoreline change at or near priority sites and places; 3) Field review of accessible sites and places at-risk of loss or major alteration due to climate change; 4) Risk assessment for each at-risk, priority site based on the results of archival research, field reviews, analyses, and Tribal consultations; and 5) Reporting and dissemination.

3) The Lessee will release a request for proposals for consultant services in consultation with the historical Chappaquiddick Wampanoag Tribe Interested consulting parties and will seek input from the historical Chappaquiddick Wampanoag Tribe on the criteria for selection and the Tribe's priorities for the consultant team's qualifications and experience.

3. National Historic Landmarks

i. The Block Island Southeast Lighthouse, National Historic Landmark. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: The Block Island Southeast Lighthouse, National Historic Landmark, Town of New Shoreham, Washington County, Rhode Island) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Physical Restoration

1) The Lessee will fund the completion of the next phase of the physical restoration at the Block Island Southeast Lighthouse. The intended outcome of this measure is to ensure the long-term preservation of the Block Island Southeast Lighthouse by completing physical repairs and/or restoration of historic building materials.

2) The scope of work will be determined in consultation with the Interested consulting parties. Prior to any work commencing, photographic and written documentation of the existing condition will be recorded.

3) The Lessee will release a request for proposals for consultant services and select a consultant to perform the scope of work. The project will require the mobilization of a qualified contract that is experienced in the repair and restoration of historic lighthouses.

b. Improvements to Parking Area, Entrance and Surrounding Landscape

1) The Lessee will fund additional aesthetic enhancement at the Block Island Southeast Lighthouse parking area and entrance, as well as improve the surrounding landscape at these areas. The intended outcome is to improve the quality of the visual setting for the historic property and improve the visitor

arrival experience in a manner that is consistent with the character of the historic property and matches the elevated importance of the site.

2) The scope of work will consist of: 1) New landscaping and potential removal of invasive or unwanted vegetation; 2) New signage explaining the history of the site and describing the challenges to preservation of the site that result from the effects of climate change; and 3) An Americans with Disabilities Act-compliant pedestrian path from the parking area to Block Island Southeast Lighthouse.

3) The Lessee will release a request for proposals for a qualified contractor to perform the scope of work. Prior to any work commencing, existing conditions will be documented including photographs and at the completion of all work, as-built documentation, including photographs will be completed.

ii. Bellevue Avenue Historic District National Historic Landmark. BOEM will include the following as described in Attachment 4 (Historic Property Treatment Plan for the Sunrise Wind Farm: Bellevue Avenue Historic District, National Historic Landmark, City of Newport, Newport County, Rhode Island) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Energy Efficiency, Greenhouse Gas Reduction, and/or HVAC/Climate Control Planning Studies

1) The Lessee will fund planning studies for energy efficiency, greenhouse gas reduction, and/or HVAC Climate Controls of public or publicly accessible contributing resources. This measure is intended to maintain the physical and historic integrity of the properties while reducing costs of maintaining the historic properties.

2) The scope of work will consist of: 1) Review existing city and state planning documents and regulations; 2) Conduct public outreach in order to identify historic preservation and energy efficiency priorities and concerns; 3) Photograph and document (e.g. map) existing conditions; 4) Draft a plan for distribution to the Interested consulting parties for review and comment; 5) Develop a final plan to include comments from the Interested consulting parties; and 6) Distribute the final plan to the Interested consulting parties.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work. The chosen consultant should have a demonstrated knowledge of energy efficiency and the treatment of historic properties.

b. Cultural Landscape Studies

1) The Lessee will provide funding for the development of Cultural Landscape Studies to support aesthetic enhancements and/or the restoration of historic landscape features (fencing/plantings/hardscaping) within public areas of the Bellevue Avenue Historic District.

2) The scope of work will consist of: 1) Review and documentation of existing conditions; 2) Review of any existing landscape plans, current or historic, within the district; 3) Consultation with Interested consulting parties and the public in order to identify needs; 4) Draft of the study/plan for distribution to the Interested consulting parties for review and comment; 5) Develop a final study/plan to include comments from the Interested consulting parties; and 6) Distribute the final study/plan to the Interested consulting parties.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meetings the SOI's Professional Qualifications to perform the scope of work.

c. Aesthetic Enhancements

1) The Lessee will provide funding for aesthetic enhancements to existing landscape features (fencing/plantings/hardscaping) consistent with historic landscape designs and based on the priorities identified in the Cultural Landscape Study.

2) The scope of work will consist of: 1) Review the existing Cultural Landscape Study and other related documentation; 2) Photograph and document (e.g. map) existing conditions; 3) Complete enhancements as identified in the Cultural Landscape Study; 4) Photograph and document (e.g. map) conditions during and post work; 5) Complete draft final report for distribution to the Interested consulting parties for review and comment; and 6) Distribute the final report to the Interested consulting parties.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meetings the SOI's Professional Qualifications to perform the scope of work.

d. Historic American Landscapes Survey (HALS) Documentation

1) The Lessee will provide funding to hire SOI Qualified professionals to develop HALS documentation for identified historic landscapes within the Bellevue Avenue Historic District. The study will document the historic designed landscapes of the Historic District according to the National Park Service guidelines and will be housed in the Library of Congress and available to the public for scholarly research, interpretation, and education.

2) The scope of work will consist of: 1) Review of existing HALS Guidelines; 2) Research to support development of history and context for the HALS report and drawings (if required); 3) Documentation of existing conditions through large-format photography, measured drawings, and historical report (dependent upon level of documentation decided upon by Interested consulting parties and the National Park Service); 4) Draft HALS documentation (to potentially include large-format photography, measured drawings and historical report) for distribution to Interested consulting parties and National Park Service for review and comment; 5) Develop final HALS documentation based on comments and revisions provided by Interested

consulting parties and National Park Service; and 6) Distribution of final HALS documentation in required formats to Interested consulting parties and the National Park Service, who will transmit to the Library of Congress.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work.

iii. Ocean Drive Historic District National Historic Landmark. BOEM will include the following as described in Attachment 4 (Historic Property Treatment Plan for the Sunrise Wind Farm: The Ocean Drive Historic District, National Historic Landmark, City of Newport, Newport County, Rhode Island) as conditions of approval of the Sunrise COP. Sunrise Wind will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Planning Conditions Assessment, or Feasibility Study for The Bells/The Reefs Property in Brenton State Park

1) The Lessee will provide funding to the State of Rhode Island, Department of Parks & Recreation to complete a conditions assessment, feasibility, or other preservation planning study for the existing buildings at Brenton State Park.

2) The scope of work will consist of: 1) Review the history and the existing conditions of the property; 2) Photograph and document existing conditions; 3) Conduct public outreach in order to identify the property's and the Department of Parks & Recreation's needs and priorities; 4) Develop a draft plan for distribution to the Interested consulting parties for review and comment; 5) Develop a final plan to include comments from Interested consulting parties; and 6) Distribute the final plan to the Interested consulting parties.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work. The chosen consultant should have a demonstrated knowledge of the treatment of historic properties.

b. Cultural Landscape Studies

1) The Lessee will provide funding for the development of Cultural Landscape Studies to support aesthetic enhancements and/or the restoration of historic landscape features (fencing/plantings/hardscaping) along Ocean Drive and/or other public roadways within the Ocean Drive Historic District.

2) The scope of work will consist of: 1) Review and documentation of existing conditions; 2) Review of any existing landscape plans, current or historic, within the district; 3) Consultation with Interested consulting parties and the public in order to identify needs; 4) Draft of the study/plan for distribution to the Interested consulting parties for review and comment; 5) Develop a final study/plan to include comments from the Interested consulting parties; and 6) Distribute the final study/plan to the Interested consulting parties.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work.

c. Historic American Landscapes Survey (HALS) Documentation

1) The Lessee will provide funding to hire SOI Qualified professionals to develop HALS documentation for the Ocean Drive Historic District. The study will document the historic designed landscapes of the Historic District according to the National Park Service guidelines and will be housed in the Library of Congress and available to the public for scholarly research, interpretation, and education.

2) The scope of work will consist of: 1) Review of the existing HALS guidelines; 2) Research to support development of history and context for the HALS report and drawings (if required); 3) Documentation of existing conditions through large-format photography, measured drawings, and historical report (dependent upon level of documentation decided upon by Interested consulting parties and National Park Service); 4) Draft HALS documentation (to potentially include large-format photography, measured drawings, and historical report) for distribution to Interested consulting parties and National Park Service for review and comment; 5) Develop a final HALS documentation based on comments and revisions provided by Interested consulting parties and National Park Service; and 6) Distribution of final HALS documentation in required formats to Interested consulting parties and National Park Service, who will transmit to the Library of Congress.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work.

iv. The Breakers National Historic Landmark. BOEM will include the following as described in Attachment 4 (Historic Property Treatment Plan for the Sunrise Wind Farm: The Breakers, National Historic Landmark, City of Newport, Newport County, Rhode Island) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. The Breakers Landscape Revival Project

1) The Lessee will provide funding for future phases of the Breakers Landscape Revival Project or related projects associated with the Rhode Island Historical Preservation and Heritage Commission-approved Breakers Landscape Master Plan, which was developed using the 2017 Cultural Landscape Report completed by Reed Hilderbrand Landscape Architects and Robinson & Associates. Providing funding for the plan will help ensure the restoration of, as well as the long-term preservation of the Ernest Bowditch-designed landscape.

2) The scope of work will consist of: 1) Review of the existing Cultural Landscape Report and other related documentation, including reports on

previously completed phases of the Breakers Landscape Revival Project; 2) Consult with the Interested consulting parties to determine the current status of the Breakers Landscape Revival Project; 3) Photograph and document (e.g. map) existing conditions; 4) Draft a work plan for distribution to the Interested consulting parties for review and comment; 5) Develop a final plan to include comments from the Interested consulting parties; 6) Distribute the final plan to the Interested consulting parties; 7) Complete the Breakers Landscape Revival Project work; 8) Photograph and document (e.g. map) conditions during and post work; 9) Complete draft final report for distribution to the Interested consulting parties for review and comment; and 10) Distribute the final report to the Interested consulting parties.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work. The chosen consultant should have a demonstrated knowledge of historic landscapes, landscape architecture, and have previous experience working at NHLs.

4. Town of Aquinnah, Dukes County, Massachusetts.

i. Gay Head Lighthouse, Gay Head – Aquinnah Town Center Historic District, Gay Head-Aquinnah Shops Area, Edwin DeVries Vanderhoop Homestead, Leonard Vanderhoop House, Tom Cooper House, Theodore Haskins House, Gay Head – Aquinnah Coast Guard Station Barracks, 71 Moshup Trail, and 3 Windy Hill Drive. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: Ten Historic Properties, Town of Aquinnah, Dukes County, Massachusetts) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Long-Term Preservation of the Edwin DeVries Vanderhoop Homestead and the Aquinnah Shops

1) The Lessee will provide funding to support the upkeep of town-owned historic buildings, structures, and landscapes in and around the Gay Head-Aquinnah Shops Area and the Edwin DeVries Vanderhoop Homestead to ensure the long-term preservation of the historic buildings, structures, and landscapes.

2) The scope of work will consist of: 1) Review of existing Town of Aquinnah and Dukes County, Massachusetts planning documents and regulations; 2) Review of existing building plans, reports, as-builts, and associated documentation; 3) Review of existing landscape plans, current or historic; 4) Photograph and document (e.g. map) existing conditions; 5) Development of a final plan to include comments from the Interested consulting parties; 6) Distribution of the final plan to the Interested consulting parties; and 7) Photograph and document as-built conditions upon completion of construction.

3) The Lessee will release a request for proposals for consultant services for the scope of work and select a consultant who meets the SOI's Professional Qualifications to perform the scope of work. The chosen consultants should have a demonstrated knowledge and experience with historic buildings, structures, and landscapes.

ii. The Gay Head Light

a. The Gay Head Light. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: The Gay Head Light, Town of Aquinnah, Dukes County, Massachusetts) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

1) Historic Rehabilitation of The Gay Head Light

- In consultation with the Town of Aquinnah and the Gay Head Light Advisory Board, the Lessee will fund the next phase of rehabilitation at the Gay Head Light. The intended outcome of this measure is to ensure the long-term preservation of the lighthouse by completing physical repairs and/or restoration of the historic building materials according to the priorities identified by a commissioned report to identify rehabilitation and/or restoration needs for the lights.

- The scope of work will be determined by the commissioned report and developed in consultation with the Interested consulting parties. Prior to any work commencing, photographic and written documentation of the existing condition will be recorded.

- The Lessee will release a request for proposals for a consultant to develop the required documents that meet the SOI's *Standards for Treatment of Historic Properties* (36 CFR 68). When the plans and specifications are available, the Lessee will release a request for proposals for a qualified contractor with experience working on historic lighthouses to perform the scope of work. The chosen contractor will document the existing conditions prior to any work commencing and will complete as-built documentation at the completion of the project.

5. Town of Chilmark, Dukes County, Massachusetts

i. The Capt. Samuel Hancock – Capt. West Mitchell House, The Russell Hancock House, The Simon Mayhew House, The Ernest Flanders House, Shop, and Barn, and Flaghole. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: Five Historic Properties, Town of Chilmark, Dukes County, Massachusetts) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Stone Wall Survey and Preservation Plan

1) The Lessee will fund a survey/inventory and preservation plan for the character-defining extant historic stone walls and public right-of-way boundary features in the Town of Chilmark. This measure is intended to preserve and enhance the stone walls that have been identified as an important character defining feature to the visual setting of historic properties in the Town of Chilmark. The intended outcome of this measure is to produce an accurate, current GIS map that locates extant historic stone walls throughout the Town of Chilmark, including both publicly maintained roadside walls, and privately owned stone walls that serve as parcel boundaries. A survey, GIS map, and historic stone wall preservation plan will assist the Town and its residents with guidance for the maintenance, preservation and/or restoration of its character-defining historic stone walls. The interactive map and preservation plan will serve as a long-term tool to assist the Town of Chilmark Planning Department in the identification and prioritization of public roadside stone wall restoration work. Private owners will benefit from guidance related to stone wall maintenance and repair included within the plan.

2) The scope of work will consist of: 1) Using publicly available 2-meter resolution LiDAR bare earth digital elevation model (DEM) data to locate historic stone walls within the Town of Chilmark; 2) Reconnaissance-level historic resources survey from public rights-of-way to determine conditions of stone walls along public roads, and inputting survey results into the GIS map; 3) Public engagement to discuss the project, and solicit feedback about privately-owned stone walls; 4) Development of a list of prioritized action items to protect, preserve and/or restore stone walls along public roads; 5) Develop stone wall maintenance and repair guidance for privately-owned historic stone walls based on public engagement; and 6) Creation of a town-wide stone wall preservation plan.

3) The Lessee will release a request for proposals for consultant services to perform the scope of work. The consultant will conduct a survey to document the location and condition of the existing stone walls. The consultant will develop a maintenance and repair plan which will include prioritization, schedule, costs, and plans and specifications as applicable in consultation with Interested consulting parties.

6. <u>The Scrubby Neck Schoolhouse</u>

i. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: The Scrubby Neck Schoolhouse, Town of West Tisbury, Dukes County, Massachusetts) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. <u>Development of a National Register of Historic Places Nomination Form</u>

1) The Lessee will fund the documentation of the historic and cultural significance of the Scrubby Neck School House by completing an NRHP Nomination.

2) The scope of work will consist of: 1) Research of available historic sources and documentation; 2) Field survey and existing conditions assessment; 3) Annotated photographs; 4) Drafting of the NRHP listing document; 5) Submitting the draft for review and comment to the Interested consulting parties; and 6) Developing a final NRHP Nomination to be provided to the Interested consulting parties.

3) The Lessee will release a request for proposals for a consultant to perform the scope of work.

7. Town of New Shoreham, Washington County, Rhode Island

i. The Old Harbor Historic District, The New Shoreham Historic District, The Beach Avenue Historic District, The Corn Neck Road Historic District, The Block Island North Lighthouse, The Indian Head Neck Road Historic District, The Hippocampus/Boy's Camp/Beane Family, The Mitchell Farm Historic District, Island Cemetery/Old Burial Ground, The Champlin Farm Historic District, The Beacon Hill Road Historic District, The Mohegan Cottage/Everett D. Barlow House, The Lewis Farm and Dickens Farm Road Historic District, The Miss Abby E. Vaill/1 of 2 Vaill Cottages, The Hon. Julius Deming Perkins/"Bayberry Lodge", Spring Street Historic District, The Caleb W. Dodge, Jr. House, The Capt. Mark L. Potter House, The Captain Welcome Dodge, Sr. House, The Pilot Hill Road and Seaweed Lane Historic District, The Spring House Hotel Cottage, The Spring House Hotel, The WWII Lookout Tower at Sands Pond, and The WWII Lookout Tower-Spring Street. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: Twenty-four Historic Properties, Town of New Shoreham, Washington County, Rhode Island) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Coastal Resiliency Planning and Implementation

1) The Lessee will fund an investigation to identify specific at-risk historic coastal properties, specifically historic roadways, breakwaters, stone walls, or other cultural features that contribute to the historic setting of individual properties and districts. The Lessee will also fund the development and implementation of engineering-based resilience projects at select historic properties or signature cultural features contributing to the historic maritime setting of districts, with the purpose of mitigating coastal hazards. Investigations will include development of a study to assess the feasibility of relocating at-risk historic buildings and associated public interpretation opportunities. The intended outcome of this measure is to provide funding to complete the investigations, project development, relocation feasibility studies, and select project implementation for high priority at-risk historic properties, to support preservation of features that contribute to the maritime setting of the Town of New Shoreham. This outcome will provide the town and historic property owners with specific measures to protect their historic properties from flooding, coastal erosion, and other climate related threats.

2) The scope of work will consist of: 1) Review of existing town planning and hazard mitigation documents, guidance, and regulations; 2) Photography and documentation (e.g. mapping) of existing conditions prior to the

commencement of any project; 3) Public outreach in order to identify historic preservation priorities and concerns; 4) Development of a prioritized list of at-risk historic and cultural resources and proposed engineering-based solutions, including schedule/timeline, and accurate cost estimates; 5) A geotechnical investigation at historic properties along the coast, as applicable; 6) Development of draft studies to be distributed to the Interested consulting parties for review and comment; 7) Development of final studies incorporating any comments received to be distributed to the Interested consulting parties; 8) Select project implementation for high priority at-risk historic properties; and 9) As-built documentation at the completion of all projects including mapping and photography.

3) The Lessee will release a request for proposals for consultant services and select a consultant to perform the scope of work. The chosen coastal and/or geotechnical engineers (or comparable consultants) should have a demonstrated knowledge of climate change and the treatment of historic properties.

8. The Point Judith Lighthouse, Town of Narragansett, Rhode Island

i. BOEM will include the following as described in Attachment 4 (Historic Properties Treatment Plan for the Sunrise Wind Farm: The Point Judith Lighthouse, Town of Narragansett, Rhode Island) as conditions of approval of the Sunrise COP. The Lessee will fund and commence the following prior to the initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Cyclical Maintenance Plan

1) The Lessee will fund the development of a cyclical maintenance plan for the Point Judith Lighthouse. The plan will be developed using the guidance in the *Historic Lighthouse Preservation Handbook*, which was developed through a partnership with the National Park Service, the U.S. Coast Guard, and the Department of Defense. The intent of this measure is to have a document to guide the property owners and custodians of this historic property and to maintain the lighthouse in good physical repair and sound structural condition for future generations of visitors.

2) The scope of work will consists of: 1) Documentation of existing conditions, including photographs and plans/drawings, as applicable; 2) Review of existing building documentation including, but not limited to, existing plans, specifications, reports, as-built documentation, and archival documents; 3) Identification of the rehabilitation and/or restoration needs of the historic property; 4) Development of plans and specifications to include any existing rehabilitation and/or restoration needs, as applicable; 5) Identification of regular maintenance needs and the development of applicable plans and specifications; 6) Development of a draft plan which should include, but is not limited to, written procedures, drawings/specifications, regular maintenance and repair schedules, checklists/forms, associated costs, procedures for existing condition and as-built documentation and photography, as applicable; 7) The draft plan will be distributed to the Interested consulting parties for review and comment; and 8) The final plan will be developed incorporating any comments and will be distributed to the Interested consulting parties for future implementation.

3) The implementing party will release a request for proposals for consultant services and select a consultant to perform the scope of work. The consultant will have a demonstrated knowledge of historic lighthouse repair, maintenance, and restoration.

IV. REVIEW PROCESS FOR DOCUMENTS

A. The following process will be used for any document, report, or plan produced in accordance with Stipulations of this MOA:

1. **Draft Document**

i. The Lessee will provide the document to BOEM for technical review and approval.

a. BOEM will have 15 calendar days to complete its technical review.
b. If BOEM does not provide approval of the document, it will submit its comments back to the Lessee who will have 15 calendar days to address the comments.

ii. BOEM, with the assistance of the Lessee, will provide the draft document to SHPO[s], invited signatories, and consulting parties, except the ACHP, for review and comment.

a. SHPO[s], invited signatories, and consulting parties will have 30 calendar days to review and comment.
b. BOEM, with the assistance of the Lessee, will coordinate a meeting with SHPO[s], invited signatories, and consulting parties to facilitate comments on the document if requested by a consulting party.
c. BOEM will consolidate comments received and provide them to the Lessee within 15 calendar days of receiving all comments from SHPO[s], invited signatories, and consulting parties.
d. BOEM with the assistance of the Lessee, will respond to the comments and make necessary edits to the documents.

2. **Draft Final Document**

i. The Lessee will provide BOEM with the draft final document for technical review and approval.

a. BOEM will have 15 calendar days to complete its technical review.
b. If BOEM does not provide approval, it will submit its comments back to the Lessee, who will have 15 calendar days to address the comments.

ii. BOEM, with the assistance of the Lessee, will provide the final draft document to SHPO[s], invited signatories, and consulting parties, except the ACHP, for review and comment. With this submittal of draft final documents, BOEM, with the assistance of the Lessee, will provide a summary of all the comments received on the documents and BOEM's responses.

a. SHPO[s], invited signatories, and consulting parties will have 30 calendar days to review and comment.
b. BOEM, with the assistance of the Lessee, will coordinate a meeting with SHPO[s], invited signatories, and consulting parties to facilitate comments on the document if requested by a consulting party.

c. BOEM will consolidate comments received and provide them to the Lessee within 15 calendar days of receiving all comments from SHPO[s], invited signatories, and consulting parties.
d. BOEM, with the assistance of the Lessee, will respond to the comments and make necessary edits to the documents.

3. **Final Document**

i. The Lessee will provide BOEM with the final document for approval.

a. BOEM has 15 calendar days to complete its technical review.
b. If BOEM does not provide approval, it will submit its comments back to the Lessee, who will have 15 calendar days to address the comments.
c. BOEM, with the assistance of the Lessee, will provide the final document to SHPO(s), invited signatories, and consulting parties, except the ACHP, within 30 calendar days of approving the final document. With this same submittal of final documents, the Lessee will provide a summary of all the comments received on the documents and BOEM's responses.

V. SUBMISSION OF DOCUMENTS

A. Connecticut and New York, SHPOs, ACHP, NPS, Tribal Nations, and Consulting Parties.
1. All submittals to the Rhode Island, New York, and Connecticut SHPOs, ACHP, NPS, Tribal Nations, and consulting parties will be submitted electronically unless a specific request is made for the submittal be provided in paper format.
2. Rhode Island and Massachusetts SHPOs:
i. All submittals to RI SHPO, if required for any document produced under an HPTP or the mitigation fund action pursuant to this MOA and unless specifically requested by RI SHPO to be for digital delivery only, will be in paper format and delivered by U.S. Mail, delivery service, or by hand.
ii. All submittals to the MA SHPO, if required for any document produced under an HPTP or the mitigation fund action pursuant to this MOA, will be in paper format and delivered by U.S. Mail, delivery service, or by hand.
iii. Plans and specifications submitted to the MA SHPO, if required for any HPTP, must measure no larger than 11- x 17-inch paper format (unless another format is agreed to in consultation); therefore, all documents produced that will be submitted to Massachusetts SHPO under this MOA, must meet this format.

VI. PROJECT MODIFICATIONS

A. If the Lessee proposes any modification(s) to the Project that expands the Project beyond the PDE included in the COP and/or occurs outside the defined APE or the proposed modifications would change BOEM's final determinations and findings for this Project, the Lessee must notify and provide BOEM with information concerning the proposed modifications. The Lessee will not proceed with the proposed modifications until the following process under Stipulation VI.A (Project Modifications) is concluded. BOEM will notify consulting parties within 60 calendar days and consult on whether these modifications require alteration of the conclusions reached in the *Finding of Effect* and, thus, may require additional consultation with the signatories and consulting parties. If BOEM determines that additional consultation is required, the Lessee will provide the signatories and consulting parties with the information concerning the proposed changes, and these parties will have 30 calendar days from receipt of this information to comment on the proposed changes. BOEM will consider any comments from signatories, and

consulting parties prior to agreeing to any proposed changes. Using the procedure below, BOEM will, as necessary, consult with the signatories, and consulting parties to identify and evaluate historic properties in any newly affected areas, assess the effects of the modification(s), and resolve any adverse effects. Any project modification allowed pursuant to this Stipulation VI would not require an amendment to the MOA.

1. If the Project is modified and BOEM identifies no additional historic properties or determines that no historic properties are adversely affected due to the modification, the Lessee will notify and consult with the signatories, and consulting parties following the consultation process set forth in this Stipulation VII.A.1.
    i. The Lessee will notify all the signatories and consulting parties about this proposed change and provide BOEM's determination as a written summary of the project modification including any maps, a summary of any additional surveys and/or research conducted to identify historic properties and assess effects, and copies of the surveys.
    ii. BOEM and the Lessee will allow the signatories and consulting parties 30 calendar days to review and comment on the proposed change, BOEM's determination, and the documents.
    iii. After the 30-calendar review period has concluded, and no comments require additional consultation, the Lessee will notify the signatories and consulting parties that BOEM has approved the project modification and, if they received any comments, provide a summary of the comments and BOEM's responses.

    iv. BOEM, with the assistance of the Lessee, will conduct any consultation meetings if requested by the signatories, or consulting parties.

    v. This MOA will not need to be amended if no additional historic properties are identified and/or adversely affected.

2. If BOEM finds new adverse effects to historic properties will occur due to a Project modification(s), BOEM with the assistance of the Lessee will notify and consult with the signatories and consulting parties regarding BOEM's finding and the proposed measures to resolve the adverse effect(s) including the development of a new HPTP(s) following the consultation process set forth in this Stipulation VI.A.2.

    i. The Lessee will notify all signatories and consulting parties about this proposed modification, BOEM's determination, and the proposed resolution measures for the adverse effect(s).

    ii. The signatories and consulting parties will have 30 calendar days to review and comment on the adverse effect finding and the proposed resolution of adverse effects, including a draft HPTP(s).

    iii. BOEM, with the assistance of the Lessee, will conduct additional consultation meetings, if necessary, during consultation on the adverse effect finding and during drafting and finalization of the HPTP(s).

    iv. BOEM, with the assistance of the Lessee, will respond to the comments and make necessary edits to the documents.

    v. The Lessee will send the revised draft final documents to the other signatories and consulting parties for review and comment during a 30-calendar day review and comment

period. With this same submittal of draft final documents, the Lessee will provide a summary of all the comments received on the documents and BOEM's responses.

vi. BOEM, with the assistance of the Lessee, will respond to the comments on the draft final documents and make necessary edits to the documents.

vii. The Lessee will notify all the signatories and consulting parties that BOEM has approved the project modification and will provide the final document(s) including the final HPTP(s) and a summary of comments and BOEM's responses to comments, if any comments are received on the draft final documents, after BOEM has received concurrence from the affected SHPO(s) on the finding of new adverse effect(s), BOEM has accepted the final HPTP(s), and BOEM has approved the Project modification.

3. If any of the signatories or consulting parties object to determinations, findings, or resolutions made pursuant to these measures (Stipulation VI.A.1 and 2), BOEM will resolve any such objections pursuant to the dispute resolution process set forth Stipulation XIII (DISPUTE RESOLUTION).

VII. CONSERVATION AND CURATION

A. Collections from federal lands or the OCS:

1. Any archaeological materials removed from federal lands or the OCS as a result of the actions required by this Project will be curated in accordance with 36 CFR 79, "Curation of Federally Owned and Administered Archaeological Collections," ACHP's "Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites" published in the Federal Register (64 Fed. Reg. 27085-27087 (May 18, 1999)), or other provisions agreed to by the consulting parties and Tribal Nations and following applicable State guidelines. No excavation should be initiated before acceptance and approval of a conservation and curation plan. If such a plan is submitted, it should include in-field and long-term curation of material culture recovered, and be submitted to BOEM and consulting parties for review.

2. Any archaeological materials removed from property owned by the NPS requires materials and associated records be treated in accordance with NPS museum management program requirements and 36 CFR 79, Curation of Federally Owned and Administered Archeological Collections. Archeological projects that include the recovery of archeological material will provide for cataloging objects, specimens, and associated records into the NPS's National Catalog of Museum Objects, and for cleaning, stabilizing, and preparing collections for storage.

3. If suspected human remains are encountered, the Lessee will comply with the Advisory Council on Historic Preservation's (ACHP) Policy Statement on Burial Sites, Human Remains, and Funerary Objects (March 2023).

B. Collections from state, local government and private lands:

1. Archaeological materials from state or local government lands in the APE and the records and documentation associated with these materials will be curated in accordance with the standards and guidelines required by the New York State Education Department and New York State SHPO for materials collected in New York, per New York State Education Law Section 233. Lands as described here may include the seafloor in state waters. No

excavation should be initiated before acceptance and approval of a curation plan, as coordinated with the New York State Museum and State Archaeologist.

2. Collections from private lands that would remain private property: In cases where archaeological survey and testing are conducted on private land, any recovered collections remain the property of the landowner. In such instances, BOEM and the Lessee, in coordination with the New York SHPO as appropriate based on which state these materials are located, and affected Tribe(s), will encourage land owners to donate the collection(s) to an appropriate public or Tribal entity. To the extent a private landowner requests that the materials be removed from the site, the Lessee will seek to have the materials donated to the repository identified under Stipulation VII.B.1 through a written donation agreement developed in consultation with the consulting parties. BOEM, assisted by Sthe Lessee, will seek to have all materials from each state curated together in the same curation facility within the state of origin. In cases where the property owner wishes to transfer ownership of the collection(s) to a public or Tribal entity, BOEM and the Lessee will ensure that recovered artifacts and related documentation are curated in a suitable repository as agreed to by BOEM, the appropriate SHPO(s), and affected Tribe(s), and following applicable State guidelines. To the extent feasible, the materials and records resulting from the actions required by this MOA for private lands, will be curated in accordance with 36 CFR 79. No excavation should be initiated before BOEM's acceptance and approval of a curation plan, and after consulting with affected SHPO(s) and Tribe(s), as applicable.

3. If suspected human remains are encountered, the Lessee will comply with the Advisory Council on Historic Preservation's (ACHP) Policy Statement on Burial Sites, Human Remains, and Funerary Objects (March 2023).

VIII. EXPERTISE AND QUALIFICATIONS

A. SOI's Standards for Archaeology and Historic Preservation. The Lessee will ensure that all work carried out pursuant to this MOA will meet the SOI Standards for Archaeology and Historic Preservation, 48 FR 44716 (September 29, 1983), taking into account the suggested approaches to new construction in the SOI's Standards for Rehabilitation.

B. SOI Professional Qualifications Standards. The Lessee will ensure that all work carried out pursuant to this MOA is performed by or under the direction supervision of historic preservation professionals who meet the SOI's Professional Qualifications Standards (48 FR 44738-44739). A "qualified professional" is a person who meets the relevant standards outlined in such SOI's Standards. BOEM, or its designee, will ensure that consultants retained for services pursuant to the MOA meet these standards.

C. Investigation of Marine Archaeological Resources and ASLFs. The Lessee will ensure that the additional investigations of ASLFs will be conducted and reports and other materials produced by one or more qualified marine archaeologists and geological specialists who meet the SOI's Professional Qualifications Standards and has experience both in conducting High Resolution Geophysical (HRG) surveys and processing and interpreting the resulting data for archaeological potential, as well as collecting, subsampling, and analyzing cores. The Lessee will work with Tribal Nations to provide them an opportunity to participate as monitors during the post-construction seafloor inspection of previously identified ASLFs in the APE (a described above). The Lessee will compensate Tribal Nations for the monitoring activities.

D. Tribal Consultation Experience. BOEM, with the assistance of the Lessee, will ensure that all work carried out pursuant to this MOA that requires consultation with Tribes is performed by

professionals who have demonstrated professional experience consulting with federally recognized Tribes.

E. BOEM Acknowledgement of the Special Expertise of Tribal Nations. BOEM recognizes that all tribal participants and knowledge need not conform to the SOI's standards, acknowledging that Tribal Nations possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to Tribal Nations, pursuant to 36 CFR 800.4(c)(1). To further apply this expertise, BOEM with the assistance of the Lessee will incorporate indigenous knowledge and ITEK into the documents and review processes when such knowledge is received from Tribal Nations in consultation and during implementation of the MOA, consistent with the Office of Science and Technology Policy and Council on Environmental Quality memorandums (Executive Branch policy) on ITEK and federal decision making (November 15, 2021) and on guidance for federal departments and agencies on indigenous knowledge (November 30, 2022). Tribal Nations are also afforded the opportunity to review the application of their knowledge in documents produced under the MOA pursuant to Stipulation V.

IX. DURATION

A. This MOA will expire at (1) the decommissioning of the Project in the Lease Area, as defined in the Lessee's lease with BOEM (Lease Number OCS-A 0487) or (2) 25-years from the date of COP approval, whichever occurs first. Prior to such time, BOEM may consult with the other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation XIV (AMENDMENTS).

X. POST-REVIEW DISCOVERIES

A. Implementation of Post-Review Discovery Plans. If historic properties are discovered that may be historically significant or have unanticipated effects on historic properties found, BOEM, with the assistance of the Lessee, will implement the post-review discovery plan (PRDP) for marine archaeology (Attachment 7, Sunrise Wind Unanticipated Discoveries Protocol for Submerged Archaeological Sites, Historic Properties, and Cultural Resources Including Human Remains) and Attachment 6 (Monitoring and Unanticipated Discoveries Protocol for Terrestrial Archaeological Resources).

1. The signatories acknowledge and agree that it is possible that additional historic properties may be discovered during the implementation of the Project, despite the completion of a good faith effort to identify historic properties throughout the APEs.

B. All Post-Review Discoveries. In the event of a post-review discovery of a historic property or unanticipated effects on a historic property prior to or during construction, installation, operation and maintenance, or decommissioning of the Project, the Lessee will implement the following actions which are consistent with the post-review discovery plans for marine archaeology (Attachment 7, Sunrise Wind Unanticipated Discoveries Protocol for Submerged Cultural Resources) and terrestrial archaeology (Attachment 6, Sunrise Wind Terrestrial Unanticipated Discovery Protocol):

1. Immediately halt all ground- or seafloor-disturbing activities within the area of discovery while taking into account whether stabilization and further protections are warranted to keep the discovered resource from further degradation and impact; and

2. Notify BOEM and BSEE simultaneously in writing via report within 72 hours of the discovery, including any recommendations on need and urgency of stabilization and additional protections for the discovered resource; and

i. In the case that the discovery is within an USACE permit area, BOEM will notify USACE, and consulting Tribes as identified in the post-review discovery plans for marine archaeology (Attachment 7) and terrestrial archaeology (Attachment 6) of the discovery after receiving notice from the Lessee.

3. Keep the location of the discovery confidential and take no action that may adversely affect the discovered property until BOEM or its designee has made an evaluation and instructs the Lessee on how to proceed

4. Conduct any additional investigations as directed by BOEM or its designee to determine, in consultation with the appropriate SHPO(s) and applicable federally recognized Tribes if the resource is eligible for listing in the NRHP (30 CFR 585.702(b)). BOEM will direct the Lessee to complete additional investigations, as BOEM deems appropriate, if:

   i. The site has been impacted by Project activities; or

   ii. Effects on the site from Project activities cannot be avoided.

5. If investigations indicate that the resource is eligible for the NRHP, BOEM, with the assistance of the Lessee, will work with the other relevant signatories and consulting parties to this MOA who have a demonstrated interest in the affected historic property and on the further avoidance, minimization or mitigation of adverse effects.

6. If there is any evidence that the discovery is from an indigenous society or appears to be a preserved burial site, the Lessee, notwithstanding Stipulation X-B.3, will contact, concurrently with BOEM, the Tribes as identified in the notification lists included in the post-review discovery plans within 72 hours of the discovery with details of what is known about the discovery, and consult with the Tribes pursuant to the post-review discovery plan.
7. If there is any evidence that the discovery is from an indigenous society or appears to be a preserved burial site, the Lessee will contact the tribal nations (the Delaware Tribe of Indians, Delaware Nation, the Shinnecock Indian Nation, Mashantucket (Western) Pequot Tribal Nation, the Mashpee Wampanoag Tribe, the Stockbridge-Munsee Community, and the Wampanoag Tribe of Gay Head (Aquinnah)) as identified in the notification lists included in the Post-review discovery plans within 72 hours of the discovery with details of what is known about the discovery, and consult with the Tribal Nations pursuant to the post review discovery plan.

8. If BOEM incurs costs in addressing the discovery, under Section 110(g) of the NHPA, BOEM may charge the Lessee reasonable costs for carrying out historic preservation responsibilities, pursuant to its delegated authority under the OCS Lands Act (30 CFR 585.702 (c)-(d)).

XI. EMERGENCY SITUATIONS

A. In the event of an emergency or disaster that is declared by the U.S. President or the Governor of New York, which represents an imminent threat to public health or safety, or creates a hazardous condition due to impacts from the Project's infrastructure damaged during the emergency and affecting historic properties in the APE, BOEM, with the assistance of the Lessee, will notify the consulting Tribes, SHPO(s) and the ACHP of the condition which has initiated a situation and measures taken to respond to the emergency or hazardous condition. BOEM will make this notification as soon as reasonably possible,

but no later than 48 hours from when it becomes aware of the emergency or disaster. If the consulting Tribes, SHPO(s) or the ACHP want to provide technical assistance to BOEM, they will submit comments within seven calendar days from notification if the nature of the emergency or hazardous condition allows for such coordination,

XII. MONITORING AND REPORTING

At the beginning of each calendar year by January 31, following the execution of this MOA until it expires or is terminated, the Lessee will prepare and, following BOEM's review and agreement to share this summary report, provide all signatories, invited signatories, and consulting parties to this MOA a summary report detailing work undertaken pursuant to the MOA. Such report will include a description of how the stipulations relating to avoidance and minimization measures Stipulation I (MEASURES TO AVOID ADVERSE EFFECTS ON IDENTIFIED HISTORIC PROPERTIES) and Stipulation II (MEASURES TO MINIMIZE ADVERSE EFFECTS ON IDENTIFIED HISTORIC PROPERTIES) were implemented; any scheduling changes proposed; any problems encountered; and any disputes and objections received in BOEM's efforts to carry out the terms of this MOA. The Lessee can satisfy its reporting requirement under this stipulation by providing the relevant portions of the annual compliance certification required under 30 CFR 285.633. If requested by the signatories, BOEM will convene an annual meeting with the signatories, and consulting parties to discuss the annual report, the implementation of this MOA, and other requested topics.

XIII. DISPUTE RESOLUTION

A. If any signatory, invited signatory, or consulting party to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, they must notify BOEM in writing of their objection. BOEM will consult with such party to resolve the objection. If BOEM determines that such objection cannot be resolved, BOEM will:

   1. Forward all documentation relevant to the dispute, including the BOEM's proposed resolution, to the ACHP. The ACHP will provide BOEM with its advice on the resolution of the objection within 30 calendar days of receiving adequate documentation. Prior to reaching a final decision on the dispute, BOEM will prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories, invited signatories, and/or consulting parties, and provide them with a copy of this written response. BOEM will make a final decision and proceed accordingly.

   2. Make a final decision on the dispute and proceed accordingly if the ACHP does not provide its advice regarding the dispute within the 30 calendar-day time period. Prior to reaching such a final decision, BOEM will prepare a written response that takes into account any timely comments regarding the dispute from the signatories, or consulting parties to the MOA, and provide each of them, and the ACHP with a copy of such written response.

B. BOEM's and the Lessee's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

C. At any time during the implementation of the measures stipulated in this MOA, if a member of the public objects in writing to the signatories regarding the manner in which the measures stipulated in this MOA are being implemented, that signatory will notify BOEM. BOEM will review the objection and may notify the other signatories as appropriate and respond to the objector.

XIV. AMENDMENTS

A. This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by the signatories is filed with the ACHP.

B. Revisions to any attachment may be proposed by any signatory by submitting a draft of the proposed revisions to all signatories with a notification to the consulting parties. The signatories will consult for no more than 30 calendar days (or another time period agreed upon by all signatories) to consider the proposed revisions to the attachment. If the signatories and invited signatories unanimously agree to revise the attachment, BOEM will provide a copy of the revised attachment to the other signatories, and consulting parties. Revisions to any attachment to this MOA will not require an amendment to the MOA.

XV. TERMINATION

If any signatory or invited signatory to this MOA determines that its terms will not or cannot be carried out, that party will immediately consult with the other signatories, and consulting parties to attempt to develop an amendment per Stipulation XIV (AMENDMENTS). If within 30 calendar days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, BOEM must either(a) execute an MOA pursuant to 36 CFR 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. BOEM will notify the signatories as to the course of action it will pursue.

XVI. COORDINATION WITH OTHER FEDERAL AGENCIES

A. In the event that another Federal agency not initially a party to or subject to this MOA receives an application for funding/license/permit for the undertaking as described in this MOA, that agency may fulfill its Section 106 responsibilities by stating in writing that it concurs with the terms of this MOA and notifying the signatories and invited signatories that it intends to do so. Such Federal agency may become a signatory, invited signatory, or a concurring party (collectively referred to as signing party) to the MOA as a means of complying with its responsibilities under Section 106 and based on its level of involvement in the undertaking. To become a signing party to the MOA, the agency official must provide written notice to the signatories and invited signatories that the agency agrees to the terms of the MOA, specifying the extent of the agency's intent to participate in the MOA. The participation of the agency is subject to approval by the signatories and invited signatories who must respond to the written notice within 30 calendar days or the approval will be considered implicit. Any necessary amendments to the MOA as a result will be considered in accordance with Stipulation XIV (AMENDMENTS).

B. Should the signatories and invited signatories approve the Federal agency's request to be a signing party to this MOA, an amendment under Stipulation XIV (AMENDMENTS) will not be necessary if the Federal agency's participation does not change the undertaking in a manner that would require any modifications to the stipulations set forth in this MOA. BOEM will document these conditions and involvement of the Federal agency in a written notification to the signatories, and consulting parties, and include a copy of the Federal agency's executed signature page, which will codify the addition of the Federal agency as a signing party in lieu of an amendment.

XVII. ANTI-DEFICIENCY ACT

BOEM's obligations under this MOA are subject to the availability of appropriated funds, and the stipulations of this MOA are subject to the provisions of the Anti-Deficiency Act. BOEM will make reasonable and good faith efforts to secure the necessary funds to implement this MOA in its entirety. If compliance with the Anti-Deficiency Act alters or impairs BOEM's ability to implement the stipulations of this agreement, BOEM will consult in accordance with the amendment and termination procedures found at Stipulations XIV (AMENDMENTS) and XV (TERMINATION) of this MOA.

Execution of this MOA by BOEM, the Massachusetts SHPO, Rhode Island SHPO, Connecticut SHPO, New York SHPO, and the ACHP, and implementation of its terms evidence that BOEM has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

[SIGNATURES COMMENCE ON THE FOLLOWING PAGE]

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE RHODE ISLAND STATE HISTORIC PRESERVATION OFFICER,
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER, THE CONNECTICUT STATE HISTORIC PRESERVATION OFFICER, SUNRISE WIND LLC, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

Signatory:

Bureau of Ocean Energy Management (BOEM)

_____ Date:_____
Elizabeth Klein
Director
Bureau of Ocean Energy Management

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE RHODE ISLAND STATE HISTORIC PRESERVATION OFFICER,
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER, THE CONNECTICUT STATE HISTORIC PRESERVATION OFFICER, SUNRISE WIND LLC, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

Signatory:

Massachusetts State Historic Preservation Officer (SHPO)

_____ Date:_____
Brona Simon State Historic Preservation Officer Massachusetts Historical Commission

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE RHODE ISLAND STATE HISTORIC PRESERVATION OFFICER,
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER, THE CONNECTICUT STATE HISTORIC PRESERVATION OFFICER, SUNRISE WIND LLC, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

Signatory:

Rhode Island State Historic Preservation Officer (SHPO)

_____ Date:_____
Jeffrey D. Emidy
Executive Director and State Historic Preservation Officer
Rhode Island Historical Preservation & Heritage Commission

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE RHODE ISLAND STATE HISTORIC PRESERVATION OFFICER,
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER, THE CONNECTICUT STATE HISTORIC PRESERVATION OFFICER, SUNRISE WIND LLC, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

Signatory:

Connecticut State Historic Preservation Officer (SHPO)

_____ Date:_____
Catherine Labadia
Deputy State Historic Preservation Officer
Connecticut State Historic Preservation Office

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
THE MASSACHUSETTS STATE HISTORIC PRESERVATION OFFICER, THE RHODE ISLAND STATE HISTORIC PRESERVATION OFFICER,
THE NEW YORK STATE HISTORIC PRESERVATION OFFICER, THE CONNECTICUT STATE HISTORIC PRESERVATION OFFICER, SUNRISE WIND LLC, AND
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

Signatory:

New York State Historic Preservation Officer (SHPO)

_____ Date:_____
Roger Daniel Mackay
Deputy Commissioner New York State Division for Historic Preservation

DRAFT MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
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THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM
Signatory:

Advisory Council on Historic Preservation (ACHP)

_____ Date:_____
Reid Nelson
Executive Director
Advisory Council on Historic Preservation

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AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
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THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE SUNRISE WIND FARM

Invited Signatory:

Sunrise Wind, LLC

_____ Date:_____
NAME
TITLE
Sunrise Wind, LLC

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AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, WAMPANOAG TRIBE OF GAY HEAD (AQUINNAH), MASHANTUCKET (WESTERN) PEQUOT TRIBAL NATION, MASHPEE WAMPANOAG TRIBE,
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Concurring Party:

Federally Recognized Tribe

_____ Date:_____
NAME
TITLE
AFFILIATION

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Concurring Party:

Federally Recognized Tribe

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Concurring Party:

Federally Recognized Tribe

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Concurring Party:

Organization

_____ Date:_____
Name
Title
Organization

DRAFT MEMORANDUM OF AGREEMENT
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LIST OF ATTACHMENTS TO THE MOA

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ATTACHMENT 1 – APE MAPS

ATTACHMENT 2 – LISTS OF INVITED AND PARTICIPATING CONSULTING PARTIES

Table 1. Parties Invited to Participate in NHPA Section 106 Consultation

Participants in the Section 106 Process	Invited Consulting Parties
SHPOs and State Agencies	Connecticut State Historic Preservation Office, Connecticut Department of Economic and Community Development
	Rhode Island Historical Preservation & Heritage Commission
	New York State Division for Historic Preservation
	Massachusetts Historical Commission
	Massachusetts Board of Underwater Archaeological Resources
	Massachusetts Commissioner on Indian Affairs
	Rhode Island Department of Environmental Management
Federal Agencies	ACHP
	BSEE
	NOAA
	USACE
	USCG
	USEPA
	USFWS
	National Park Service
	DASNE
	FAA
	USDOD
	Fire Island National Seashore
Federally Recognized Tribes	Mashpee Wampanoag Tribe
	Shinnecock Indian Nation
	Mashantucket Pequot Tribal Nation
	Wampanoag Tribe of Gay Head - Aquinnah
	Mohegan Tribe of Indians of Connecticut
	Narragansett Indian Tribe
	Delaware Tribe of Indians
	The Delaware Nation
Non-Federally Recognized Tribe	Chappaquiddick Tribe of Wampanoag Nation
	Unkechaug Nation
	The Golden Hill Paugussett
	Eastern Pequot Tribal Nation
	Schaghticoke Tribal Nation
Local Government	City of New Bedford
	City of Newport

Participants in the Section 106 Process	Invited Consulting Parties
	County of Barnstable (MA)
	County of Bristol (MA)
	County of Dukes (MA)
	County of Suffolk (NY)
	Town of Acushnet
	Town of Aquinnah
	Town of Bourne
	Town of Charlestown
	Town of Chilmark
	Town of Dartmouth
	Town of East Hampton
	Town of Edgartown
	Town of Exeter
	Town of Fairhaven
	Town of Falmouth
	Town of Gosnold
	Town of Jamestown
	Town of Little Compton
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission (NP&EDC)
	Town of Narragansett
	Town of New Shoreham
	Town of North Kingstown
	Town of North Stonington
	Town of Oak Bluffs
	Town of Portsmouth
	Town of South Kingstown
	Town of Southold
	Town of Stonington
	Town of Tisbury
	Town of Tiverton
	Town of West Tisbury
	Town of West Warwick
	Town of Westerly
	Town of Westport

Participants in the Section 106 Process	Invited Consulting Parties
	Town of Brookhaven
	Cape Cod Commission
Certified Local Governments	Edgartown Historic Preservation Commission
	Acushnet Historical Commission
	North Kingstown Historic District Commission
	East Hampton Design Review Board
	Narragansett Historic District Commission
	Newport Historic District Commission
	South Kingstown Historic District Commission
	New Shoreham Historic District Commission
	Barnstable Historical Commission
	Bourne Historic Commission
	Chilmark Historical Commission
	Dartmouth Historical Commission
	Fairhaven Historical Commission
	Falmouth Historical Commission
Nongovernmental Organizations or Groups	Salve Regina University
	Norman Bird Sanctuary
	Montaukett Indian Nation
	Nantucket Historical Commission
	Nantucket Historic District Commission
	Gay Head Lighthouse Advisory Committee
	Southeast Lighthouse Foundation
	Block Island Historical Society
	Martha's Vineyard Commission
	Alliance to Protect Nantucket Sound
	Montauk Historical Society
	Preservation Massachusetts
	Bristol Historical and Preservation Society
	East Greenwich Historic Preservation Society
	The Preservation Society of Newport County (operate The Breakers, Marble House, etc.)
	Newport Historical Society
	Rhode Island Historical Society (operates The John Brown House Museum, Aldrich House, etc.)
	Newport Restoration Foundation
	Bellport-Brookhaven Historical Society
	Little Compton Historical Society

Participants in the Section 106 Process	Invited Consulting Parties
	Jamestown Historical Society
	Middletown Historical Society
	Portsmouth Historical Society
	Tiverton Historical Society
	Charlestown Historical Society
	Exeter Historical Association
	Narragansett Historical Society
	Westerly Historical Society
	Martha's Vineyard Museum
	Cuttyhunk Historical Society, Museum of the Elizabeth Islands, Massachusetts
	Nantucket Historical Association
	Nantucket Preservation Trust
	Stonington Historical Society
	New London County Historical Society
	Suffolk County Historical Society
	East Hampton Historical Society
	Southold Historical Museum
	Aquinnah Wampanoag Indian Museum
	The Barnstable Historical Society
	Falmouth Historical Society and Musums on the Green
	Dartmouth Historical and Arts Society
	Westport Historical Society
	New Bedford Historical Society
	Fairhaven Historical Society
	Long Plain Museum
	Bourne Historical Society
	Long Island Historical Societies
	Preservation Long Island
	Davis Town Meeting House Society Inc.

Table 2. Consulting Parties Participating in Section 106 Consultation

Participants in the Section 106 Process	Invited Consulting Parties That Participated in Consultation
SHPOs and State Agencies	Connecticut State Historic Preservation Office, Connecticut Department of Economic and Community Development
	Rhode Island Historical Preservation & Heritage Commission
	New York State Division for Historic Preservation
	Massachusetts Historical Commission
	Massachusetts Commissioner on Indian Affairs
	Rhode Island Department of Environmental Management
Federal Agencies	ACHP
	BSEE
	NOAA
	USACE
	USCG
	USEPA
	USFWS
	National Park Service
	DASNE
	FAA
	USDOD
	Fire Island National Seashore
Federally Recognized Tribes	Mashpee Wampanoag Tribe
	Shinnecock Indian Nation
	Mashantucket Pequot Tribal Nation
	Wampanoag Tribe of Gay Head - Aquinnah
	Mohegan Tribe of Indians of Connecticut
	Narragansett Indian Tribe
	Delaware Tribe of Indians
	The Delaware Nation
Non-Federally Recognized Tribe	Unkechaug Nation
Local Government	City of Newport
	County of Dukes (MA)
	Town of Aquinnah
	Town of Bourne
	Town of Charlestown
	Town of East Hampton

Participants in the Section 106 Process	Invited Consulting Parties That Participated in Consultation
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission (NP&EDC)
	Town of New Shoreham
	Town of North Stonington
	Town of Oak Bluffs
	Town of Brookhaven
Certified Local Governments	Newport Historic District Commission
	Barnstable Historical Commission
Nongovernmental Organizations or Groups	Salve Regina University
	Norman Bird Sanctuary
	Montaukett Indian Nation
	Nantucket Historical Commission
	Nantucket Historic District Commission
	Gay Head Lighthouse Advisory Committee
	Southeast Lighthouse Foundation
	Block Island Historical Society
	Alliance to Protect Nantucket Sound
	Newport Restoration Foundation Narragansett Historical Society
	Nantucket Historical Association
	Nantucket Preservation Trust
	The Preservation Society of Newport County (operate The Breakers, Marble House, etc.)
	Long Island Historical Societies
	Preservation Long Island
Landowners	Donna Banky
	Blake Banky
	David Bush-Brown
	Austin Feeny
	Kathleen Keating Kits van Heyningen
	Martian Kits van Heyningen
	Margaret Maloney
	Sean Maloney
	Alexandra McCabe
	Roselle McConnell
	Al O'Neill

Participants in the Section 106 Process	Invited Consulting Parties That Participated in Consultation
	Susan Petrovas
	Ronal Pulito
	Mark Stenning
	William Willis

Table 3. Parties Invited to Consult under Section 106 and that Did Not Participate in Consultation

Participants in the Section 106 Process	Invited Consulting Parties that Did Not Participate in Consultation
Non-Federally Recognized Tribe	Chappaquiddick Tribe of Wampanoag Nation
	The Golden Hill Paugussett
	Eastern Pequot Tribal Nation
	Schaghticoke Tribal Nation
Local Government	City of New Bedford
	County of Barnstable (MA)
	County of Bristol (MA)
	County of Suffolk (NY)
	Town of Acushnet
	Town of Charlestown
	Town of Chilmark
	Town of Dartmouth
	Town of Edgartown
	Town of Exeter
	Town of Fairhaven
	Town of Falmouth
	Town of Gosnold
	Town of Jamestown
	Town of Little Compton
	Town of Narragansett
	Town of North Kingstown
	Town of Portsmouth
	Town of South Kingstown
	Town of Southold
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	Town of Tisbury
	Town of Tiverton
	Town of West Tisbury
	Town of West Warwick
	Town of Westerly
	Town of Westport
	Cape Cod Commission
Nongovernmental Organizations or Groups	Martha's Vineyard Commission
	Alliance to Protect Nantucket Sound
	Montauk Historical Society
	Preservation Massachusetts
	Bristol Historical and Preservation Society
	East Greenwich Historic Preservation Society
	Newport Historical Society
	Rhode Island Historical Society (operates The John Brown House Museum, Aldrich House, etc.)
	Bellport-Brookhaven Historical Society
	Little Compton Historical Society
	Jamestown Historical Society
	Middletown Historical Society

Participants in the Section 106 Process	Invited Consulting Parties that Did Not Participate in Consultation
	Portsmouth Historical Society
	Tiverton Historical Society
	Charlestown Historical Society
	Exeter Historical Association
	Westerly Historical Society
	Martha's Vineyard Museum
	Cuttyhunk Historical Society, Museum of the Elizabeth Islands, Massachusetts
	Stonington Historical Society
	New London County Historical Society
	Suffolk County Historical Society
	East Hampton Historical Society
	Southold Historical Museum
	Aquinnah Wampanoag Indian Museum
	The Barnstable Historical Society
	Falmouth Historical Society and Museums on the Green
	Dartmouth Historical and Arts Society
	Westport Historical Society
	New Bedford Historical Society
	Fairhaven Historical Society
	Long Plain Museum
	Bourne Historical Society
	Davis Town Meeting House Society Inc

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Sunrise Wind - Appendix K: References Cited

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APPENDIX K: REFERENCES CITED

K.1. Executive Summary and Chapter 1

Bureau of Ocean Energy Management (BOEM). 2014. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Massachusetts: revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/MA/Revised-MA-EA-2014.pdf.

Bureau of Ocean Energy Management (BOEM). 2016. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore New York: environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/NY/NY-Public-EA-June-2016.pdf.

Bureau of Ocean Energy Management (BOEM). 2018. Draft guidance regarding the use of a project design envelope in a construction and operations plan. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/renewable-energy-program/Draft-Design-Envelope-Guidance.pdf.

Bureau of Ocean Energy Management (BOEM). 2021. Notice of intent to prepare an environmental impact statement for the proposed Sunrise Wind Farm project on the Northeast Atlantic Outer Continental Shelf. Extension of comment period and corrections. September 3, 2021. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/ documents/renewable-energy/state-activities/86-FR-49563.pdf.

Council on Environmental Quality (CEQ). 2020. Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act. [accessed 2023 Dec 4]. https://www.federalregister.gov/d/2020-15179.

Minerals Management Service (MMS). 2009. Renewable energy and alternate uses of existing facilities on the Outer Continental Shelf. Federal Register 74:19638–19871. [accessed 2022 Jun 10]. https://www.govinfo.gov/app/details/FR-2009-04-29/E9-9462.

New York State Energy Research and Development Authority (NYSERDA). 2019. Launching New York's offshore wind industry: phase 1 report. Report no. 19-41. [accessed 2022 Jun 29]. https://docslib.org/doc/7563888/launching-new-yorks-offshore-wind-industry-phase-1-report.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

K.2. Chapter 2

American Society of Civil Engineers (ASCE). 2014. Flood resistant design and construction (24-14). [accessed 2022 July 10]. https://sp360.asce.org/PersonifyEbusiness/Merchandise/Product-Details/productId/233129242.

Bureau of Ocean Energy Management (BOEM). 2018. Draft guidance regarding the use of a project design envelope in a construction and operations plan. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/renewable-energy-program/Draft-Design-Envelope-Guidance.pdf.

Bureau of Ocean Energy Management (BOEM). 2022. Process for identifying alternatives for environmental reviews of offshore wind construction and operations plans pursuant to the National Environmental Policy Act (NEPA). [accessed 2023 Jul 07]. https://www.boem.gov/sites/default/files/documents/renewable-energy/BOEM%20COP%20EIS%20Alternatives-2022-06-22.pdf.

Environmental Management and Construction Plan 1 and 2 (EM&CP). 2023. Application of Sunrise Wind LLC for a certificate of environmental compatibility and public need in the Town of Brookhaven in Suffolk County. New York State Department of Public Service. [accessed 2022 July 10]. https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=20-T-0617.

National Renewable Energy Laboratory (NREL). 2023.Review of Glauconite Soils Issues for Sunrise Wind. Preliminary Technical Memo. August 10, 2023.

Ordtek. 2022. Munitions and explosives of concern and unexploded ordinance with risk assessment and risk mitigation strategy - confidential. Appendix G2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Ørsted Offshore North America. 2023a. Sunrise Wind cable burial feasibility assessment - confidential. Appendix G4 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. June 2023.

Ørsted Offshore North America. 2023b. Feasibility study for wind turbine generator monopile foundations - confidential. Appendix G3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. June 2023.

Sunrise Wind LLC (Sunrise Wind). 2020. Emergency response plan/oil spill response plan - confidential. Appendix E1 in Construction and Operations Plan Sunrise Wind Farm. December 2020.

Sunrise Wind LLC (Sunrise Wind). 2022. Safety management system - confidential. Appendix E2 in Construction and Operations Plan Sunrise Wind Farm. August 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Geological Survey (USGS). 2022. Geographic names information system: Digital Gazetteer. Reston, VA. U.S. Geological Survey, National Mapping Division. [accessed 2022 Oct 10]. https://www.usgs.gov/tools/geographic-names-information-system-gnis.

K.3. Chapter 3

K.3.1. Section 3.1 – Impact Producing Factors

Bureau of Ocean Energy Management (BOEM). 2017. Evaluating benefits of offshore wind energy projects in NEPA. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2017-048.

Bureau of Ocean Energy Management (BOEM). 2019. National Environmental Policy Act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic Outer Continental Shelf. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2019-036.

K.3.2. Section 3.4 – Air Quality

AKRF, Inc. (AKRF). 2021. Air quality emissions calculations and methodology. Appendix K in Construction and operations plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. June 2021.

AKRF, Inc. (AKRF). 2023a. OCS air permit application. Submitted to EPA Region 1 by Sunrise Wind LLC. February 2023.

AKRF, Inc. (AKRF). 2023b. Sunrise Wind class 1 air quality and visibility impact analysis report. Submitted to EPA Region 1 by Sunrise Wind LLC. February 2023.

Barthelmie RJ, Pryor SC. 2021. Climate change mitigation potential of wind energy. Climate 9(9):136.

Chang R, Do B, Billings R. 2017. Technical documentation for the offshore wind energy facilities emission estimating tool. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2017-079.

Commonwealth of Massachusetts. 2022a. GHG emissions and mitigation policies. [accessed 2022 Feb 14]. https://www.mass.gov/info-details/ghg-emissions-and-mitigation-policies#greenhouse-gas-emissions-trends-.

Commonwealth of Massachusetts. 2022b. Designations and attainment. [accessed 2022 Feb 14]. https://www.mass.gov/service-details/designations-attainment.

Commonwealth of Massachusetts. 2023. Appendix C: Massachusetts annual greenhouse gas emissions inventory: 1990-2020, with partial 2021 & 2022 data. [accessed 2023 May 12]. https://www.mass.gov/lists/massdep-emissions-inventories#2.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 2016. Attainment and nonattainment of the national ambient air quality standards in Connecticut. [accessed 2022 Feb 14]. https://portal.ct.gov/DEEP/Air/Attainment-of-the-National-Ambient-Air-Quality-Standards.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 2023. 1990-2021 Connecticut greenhouse gas emissions inventory. [accessed 2023 May 12]. https://portal.ct.gov/-/media/DEEP/climatechange/1990-2021-GHG-Inventory/DEEP_GHG_Report_90-21_Final.pdf.

Council on Environmental Quality (CEQ). 2023. National Environmental Policy Act guidance on consideration of greenhouse gas emissions and climate change. [accessed 2023 Apr 12]. https://www.federalregister.gov/d/2023-00158.

Interagency Working Group on Social Cost of Greenhouse Gases (IWG). 2021. Technical support document: social cost of carbon, methane, and nitrous oxide – interim estimates under executive order 13990. [accessed 2023 May 11]. https://www.whitehouse.gov/wp-content /uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf.

Katzenstein W, Apt J. 2009. Air emissions due to wind and solar power. Environmental Science and Technology 43(2):253–258.

Maryland Department of the Environment (MD DE). 2022. Greenhouse gas inventory. [accessed 2023 May 12]. https://mde.maryland.gov/programs/air/ClimateChange/Pages/Greenhouse GasInventory.aspx.

Massachusetts Department of Environmental Protection (MA DEP). 2018. Certification of adequacy of the Massachusetts state implementation plan to meet the nonattainment new source review requirements of the Clean Air Act for the 2008 Ozone National Ambient Air Quality Standards for Dukes County, Boston, MA. [accessed 2022 Feb 15]. https://www.mass.gov/doc/ nonattainment -new-source-review-sip-for-the-2008-ozone-standard-february-2018/download.

National Park Service (NPS). 2018. National parks and the Clean Air Act. [accessed 2022 Jan 24]. https://www.nps.gov/subjects/air/cleanairact.htm.

National Park Service (NPS). 2020. Air quality Fire Island. [accessed 2022 Jan 24]. https://www.nps.gov/ fiis/learn/nature/airquality.htm.

New Jersey Department of Environmental Projection (NJ DEP). 2022a. 2020 New Jersey global warming response act 80x50 report. [accessed 2022 Feb 14]. https://www.nj.gov/dep/climatechange/ mitigation.html.

New Jersey Department of Environmental Projection (NJ DEP). 2022b. Attainment area status. [accessed 2022 Feb 14]. https://www.state.nj.us/dep/baqp/aas.html.

New Jersey Department of Environmental Projection (NJ DEP). 2022c. New Jersey greenhouse gas inventory 2022 mid-cycle update report. [accessed 2023 May 12]. https://www.nj.gov/wp-content/uploads/ghg/2022-ghg-inventory-mcu_final.pdf

New York State (NYS). 2022. The Climate Leadership and Community Protection Act. [accessed 2022 Feb 14]. https://climate.ny.gov/Our-Climate-Act.

New York State Department of Environmental Conservation (NYSDEC). 2021. 2021 statewide GHG emissions report. [accessed 2022 Feb 14]. https://www.dec.ny.gov/docs/administration_ pdf/ghgsumrpt21.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2022. Establishing a value of carbon guidelines for use by state agencies. [accessed 2022 Feb 14] https://www.dec.ny.gov/ docs/administration_pdf/vocguid22.pdf.

Rhode Island Department of Environmental Management (RI DEM). 2022. 2019 Rhode Island greenhouse gas emissions inventory. [accessed 2022 Feb 14] http://www.dem.ri.gov/ environmental-protection-bureau/air-resources/greenhouse-gas-emissions-inventory.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Environmental Protection Agency (USEPA). 2021a. NAAQS table. Washington DC. [accessed 2022 Jan 24]. https://www.epa.gov/criteria-air-pollutants/naaqs-table.

United States Environmental Protection Agency (USEPA). 2021b. NAAQS designations process. Washington DC. [accessed 2022 Jan 06]. https://www.epa.gov/criteria-air-pollutants/naaqs-designations-process.

United States Environmental Protection Agency (USEPA). 2021c. Overview of greenhouse gases. Washington DC. [accessed 2022 Jan 24]. https://www.epa.gov/ghgemissions/overview-greenhouse-gases.

United States Environmental Protection Agency (USEPA). 2021d. Sulfur hexafluoride (SF5) basics. Washington DC. [accessed 2022 Jan 24]. https://www.epa.gov/eps-partnership/sulfur-hexafluoride-sf6-basics.

United States Environmental Protection Agency (USEPA). 2021e. Inventory of U.S. greenhouse gas emissions and sinks 1990-2019. Report No. EPA 430-R-21-005; 791 p. [accessed 2022 Jan 24]. https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019.

United States Environmental Protection Agency (USEPA). 2021f. Outer continental shelf air permits. Washington DC. [accessed 2022 Feb 14]. https://www.epa.gov/caa-permitting/outer-continental-shelf-air-permits.

United States Environmental Protection Agency (USEPA). 2021g. Nonattainment NSR basic information. Washington DC. [accessed 2022 Jan 24]. https://www.epa.gov/nsr/nonattainment-nsr-basic-information.

United States Environmental Protection Agency (USEPA). 2021h. Prevention of significant deterioration basic information. Washington DC. [accessed 2022 Jan 24]. https://www.epa.gov/nsr/ prevention -significant-deterioration-basic-information.

United States Environmental Protection Agency (USEPA). 2021i. Nonattainment areas for criteria pollutants (Green Book). Washington DC. [accessed 2022 Jan 19]. https://www.epa.gov/green-book.

United States Environmental Protection Agency (USEPA). 2021j. General conformity de minimus tables. Washington DC. [accessed 2022 Jan 24]. https://www.epa.gov/general-conformity/de-minimis-tables.

United States Environmental Protection Agency (USEPA). 2021k. Greenhouse gas inventory data explorer. Washington DC. [accessed 2022 Feb 14]. https://cfpub.epa.gov/ghgdata/ inventoryexplorer/#allsectors/allsectors/allgas/gas/all.

United States Environmental Protection Agency (USEPA). 2022a. 2017 national emissions inventory (NEI) data. Washington DC. [accessed 2022 Feb 14]. https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data.

United States Environmental Protection Agency (USEPA). 2022b. What are hazardous air pollutants? Washington DC. [accessed 2022 Feb 14]. https://www.epa.gov/haps/what-are-hazardous-air-pollutants.

United States Environmental Protection Agency (USEPA). 2022c. List of areas protected by the regional haze program. [accessed 2022 Jul 15]. https://www.epa.gov/visibility/list-areas-protected-regional-haze-program.

United States Environmental Protection Agency (USEPA). 2022d. CO-benefits risk assessment health impacts screening and mapping tool (COBRA). [accessed 2022 Jul 17]. https://cobra.epa.gov/.

United States Environmental Protection Agency (USEPA). 2023a. National ambient air quality standards for criteria pollutants. [accessed 2023 Jul 05]. https://www.epa.gov/criteria-air-pollutants/naaqs-table.

United States Environmental Protection Agency (USEPA). 2023b. 2020 National emissions inventory (NEI) data. Washington DC. [accessed 2023 May 12]. https://www.epa.gov/air-emissions-inventories/2020-nei-supporting-data-and-summaries.

United States Environmental Protection Agency (USEPA). 2023c. General conformity de minimus tables. [accessed 2023 Sep 11]. https://www.epa.gov/general-conformity/de-minimis-tables.

United States Environmental Protection Agency (USEPA). 2023d. Greenhouse gas equivalencies calculator. [accessed 2023 May 09]. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

United States Forest Service, National Park Service, United States Fish and Wildlife Service (USFS, NPS, USFWS). 2010. Federal land managers' air quality related values work group (FLAG): phase I report—revised (2010). Natural Resource Report NPS/NRPC/NRR—2010/232. National Park Service, Denver, Colorado.

Virginia Department of Environmental Quality (VDEQ). 2021. Greenhouse gases. [accessed 2022 Feb 14]. https://www.deq.virginia.gov/air/greenhouse-gases.

K.3.3. Section 3.5 – Water Quality

Bathis WL, Hyland JL, Fulton MH, Wirth EF, Kiddon JA, Macauley J. 2009. Ecological condition of coastal ocean waters along the U.S. mid-Atlantic Bight: 2006. NOAA Technical Memorandum NOS NCCOS 109, EPA 600/R-09/159. Silver Spring (MD).

Bejarano AC, Michel J, Rowe J, Li Z, French McCay D, Schmidt Etkin D. 2013. Environmental risks, fate, and effects of chemicals associated with wind turbines on the Atlantic outer continental shelf. Herndon (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 355 p. Report No.: OCS Study BOEM 2013-213.

Bureau of Ocean Energy Management (BOEM). 2013. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Rhode Island and Massachusetts. Revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 417 p. Report No. OCS EIA/EA BOEM 2013-1131.

Carpenter JR, Merckelback L, Callies U, Clark S, Gaslikova L, Baschek B. 2016. Potential impact of offshore wind farms on North Sea stratification. PLoS ONE 11(8): e0160830.

Cazenave PW, Torres R, Allen JI. 2016. Unstructured grid modelling of offshore wind farm impacts on seasonally stratified shelf seas. Progress in Oceanography 145 (2016): 25-41.

Chen C, Beardsley RC, Qi J, Lin H. 2016. Use of finite volume modeling and the northeast coastal ocean forecast system in offshore wind energy resource planning. Final Report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. BOEM 2016-050. 131 p.

Christiansen N, Daewel U, Schrum C. 2022. Tidal mitigation of offshore wind wake effects in coastal seas. Front. Mar. Sci. 9:1006647.

Codiga DL, Ullman DS. 2011. Characterizing the physical oceanography of coastal waters off Rhode Island, part 1: Literature review, available observations, and a representative model simulation. Prepared for the Rhode Island Ocean Special Area Management Plan. Volume 2: technical reports. 170 p. [accessed 2022 Jan 25]. http://www.crmc.ri.gov/samp_ocean.html.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 2020. Integrated water quality report 2020. Hartford (CT): Bureau of Water Protection and Land Reuse. 62 p. [accessed 2022 Mar 03]. https://portal.ct.gov/media/DEEP/water/water_quality_management/ 305b/2020/ 2020IWQRFinal.pdf.

Daewel U, Akhtar N, Christiansen N, Schrum C. 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Communications Earth & Environment 3(292).

Federal Maritime and Hydrographic Agency, Helmholtz-Zentrum Hereon (BSH and Hereon). 2022. Chemical emissions from offshore wind farms. Summary of the project OffCEm. [accessed 2023 May 25]. https://tethys.pnnl.gov/author/federal-maritime-hydrographic-agency.

Floeter J, van Beusekom JEE, Auch D, Callies U, Carpenter J, Dudeck T, Eberle S. 2017. Pelagic effects of offshore wind farm foundations in the stratified North Sea. Progress in Oceanography 156: 154-173.

Johnson TL, van Berkel JJ, Mortensen LO, Bell MA, Tiong I, Hernandez B, Snyder DB, Thomsen F, Svenstrup Petersen O. 2021. Hydrodynamic modeling, particle tracking and agent-based modeling of larvae in the U.S. mid-Atlantic bight. Lakewood (CO): U.S. Department of the Interior, Bureau of Ocean Energy Management. 232 p. Report No. OCS Study BOEM 2021-049.

Kirchgeorg T, Weinberg I, Hornig M, Baier R, Schmid MJ, Brockmeyer B. 2018. Emissions from corrosion protection systems of offshore wind farms: evaluation of the potential impact on the marine environment. Marine Pollution Bulletin 136: 257-268.

Lentz SJ. 2017 Seasonal warming of the middle Atlantic bight cold pool. Journal of Geophysical Research: Oceans 122: 941–954. 10.1002/2016JC012201.

Massachusetts Department of Environmental Protection (MA DEP). 2020. Final 2018/2020 integrated list of waters. Worcester (MA). 225 p. [accessed 2022 Mar 03]. https://www.mass.gov/doc/final-massachusetts-integrated-list-of-waters-for-the-clean-water-act-20182020-reporting-cycle/download.

Middleton P, Barnhart B. 2022. Supporting National Environmental Policy Act documentation for offshore wind energy development related to high voltage direct current cooling systems. Washington (DC): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2022-023. 13 p.

National Oceanic and Atmospheric Administration (NOAA). 2021. Bringing ocean data to your fingertips. [accessed 2022 Mar 03]. https://oceanservice.noaa.gov/ocean/ocean-reports/.

New Jersey Department of Environmental Protection (NJ DEP). 2022. Water quality assessment lower Delaware water region (2018 Integrated Report). https://www.nj.gov/dep/wms/bears/assessment.htm.

New York Codes, Rules, and Regulations (NYCRR). 2021a. Classifications and standards of quality and purity assigned to fresh surface and tidal salt waters within Great South Bay (Easterly section) drainage basin. Title 6, Chapter X, Subchapter B, Article 16, Part 922. [accessed 2022 Jan 26]. https://govt.westlaw.com/nycrr/Document/I4ee03005cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default).

New York Codes, Rules, and Regulations (NYCRR). 2021b. Class SA saline surface waters. Title 6, Chapter X, Subchapter A, Article 2, Part 701. [accessed 2022 Jan 26]. https://govt.westlaw.com/nycrr/Document/I4ed840c2cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1.

New York Codes, Rules, and Regulations (NYCRR). 2021c. Narrative water quality standards. Title 6, Chapter X, Subchapter A, Article 2, Part 703.2. [accessed 2022 Jan 26]. https://govt.westlaw.com/nycrr/Document/I4ed8dd14cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default).

New York Codes, Rules, and Regulations (NYCRR). 2021d. Water quality standards for pH, dissolved oxygen, dissolved solids, odor, color, and turbidity. Title 6, Chapter X, Subchapter A, Article 2, Part 703.3. [accessed 2022 Jan 26]. https://govt.westlaw.com/nycrr/Document/I4ed90412cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default).

New York Codes, Rules, and Regulations (NYCRR). 2021e. Class C fresh surface waters. Title 6, Chapter X, Subchapter A, Article 2, Part 701. [accessed 2022 Jan 26]. https://govt.westlaw.com/nycrr/Document/I4ed819c1cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default).

New York State Department of Environmental Conservation (NYSDEC). 2008. Carmans River biological assessment, 2008 survey. Albany (NY): Stream Biomonitoring Unit, Bureau of Water Assessment

and Management. 50 p. [accessed 2022 Jan 26]. https://nysl.ptfs.com/data/Library1/Library1/pdf/988334658.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2021a. Carmans River, upper, and tribs (Segment ID 1701-0102), waterbody segment assessment factsheet based on the 2021 CALM. [accessed 2022 Feb 18]. https://www.dec.ny.gov/data/WQP/PWL/1701-0102.html?req=70900.

New York State Department of Environmental Conservation (NYSDEC). 2021b. Great South Bay, East (Segment ID 1701-0039), waterbody segment assessment factsheet based on the 2021 CALM. [accessed 2022 Feb 18]. https://www.dec.ny.gov/data/WQP/PWL/1701-0039.html?req=51032.

New York State Department of Environmental Conservation (NYSDEC). 2022a. Atlantic Ocean/Long Island Sound watershed. [accessed 2022 Jan 26]. https://www.dec.ny.gov/lands/48375.html.

New York State Department of Environmental Conservation (NYSDEC). 2022b. NYS section 303(d) list of impaired/TMDL waters: Draft 2020-2022 Clean Water Act section 303(d) list of impaired waters. [accessed 2022 Feb 18]. https://www.dec.ny.gov/chemical/31290.html.

Rhode Island Department of Environmental Management (RI DEM). 2022. Integrated water quality monitoring and assessment reporting. Draft 2022 303(d) list. Providence (RI); Office of Water Resources. 76 p. [accessed 2022 Mar 03]. http://www.dem.ri.gov/programs/benviron/water/quality/pdf/303d22.pdf.

Schultze LKP, Merckelbach LM, Horstmann J, Raasch S, Carpenter JR. 2020. Increased mixing and turbulence in the wake of offshore windfarm foundations. Journal of Geophysical Research: Oceans 125: e2019JC015858. 10.1029/2019J.

Stantec Consulting Services Inc (Stantec). 2022. Offshore ecological assessment and field survey report confidential. Appendix L in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Suffolk County Department of Health Services (SCDHS). 2020. Suffolk County sub-watersheds wastewater plan. 842 p. [accessed 2022 Feb 18]. https://suffolkcountyny.gov/Portals/0/formsdocs/planning/ CEQ/2020/SWP%20FINAL%20July%202020.pdf.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared for Sunrise Wind LLC by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Town of Brookhaven. 2013. Draft generic environmental impact statement for the Carmans River conservation and management plan. Volume 1. 80 p. [accessed 2022 Jan 26]. https://www.brookhavenny.gov/DocumentCenter/View/987/Carmans-River-Conservation-and-Management-Plan-DGEIS-PDF.

TRC Companies, Inc. (TRC). 2021. United States Environmental Protection Agency national pollutant discharge elimination system (NPDES) permit application. Sunrise Wind offshore converter station. Submitted to USEPA in December 2021.

Trout Unlimited Long Island Chapter (TU). 2022. Carmans River. [accessed 2022 Jan 26]. http://www.longislandtu.org/carmans-river.html.

United States Environmental Protection Agency (USEPA). 2012. National coastal condition report IV. Washington DC. [accessed 2022 Feb 18]. https://www.epa.gov/national-aquatic-resource-surveys/national-coastal-condition-report-iv-2012.

United States Environmental Protection Agency (USEPA). 2021a. Map of sole source aquifer locations. Washington DC. [accessed 2022 Feb 18]. https://www.epa.gov/dwssa/map-sole-source-aquifer-locations.

United States Environmental Protection Agency (USEPA). 2021b. Ocean disposal map. Washington DC. [accessed 2022 Jan 28]. https://www.epa.gov/ocean-dumping/ocean-disposal-map.

United States Environmental Protection Agency (USEPA). 2023. Draft NPDES Permit No. MA0004940. Sunrise Wind Project. BOEM Renewable Lease Area OCS-A0487. May 18, 2023.

United States Geological Survey (USGS). 2023. USGS 01305000 Carmans River at Yaphank, NY. Department of the Interior United States Geological Survey. [accessed 2023 May 24]. https://waterdata.usgs.gov/usa/nwis/uv?01305000.

Van Berkel J, Burchard H, Christensen A, Mortensen LO, Petersen OS, Thomsen F. 2020. The effects of offshore wind farms on hydrodynamics and implications for fishes. Oceanography 33(4): 108-117.

Woods Hole Group. 2022. Hydrodynamic and sediment transport modeling Sunrise Wind Farm Project. 173 p. Prepared for Sunrise Wind LLC. Revision 2. August 2022.

K.3.4. Section 3.6 – Bats

Bureau of Ocean Energy Management (BOEM). 2019. Vineyard Wind Offshore Wind Energy Project biological assessment: final. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 55 p.

Bureau of Ocean Energy Management (BOEM). 2021. Appendix A: planned action offshore wind scenario and assessment of resources with minor impacts. Vineyard Wind 1 Offshore Wind Energy Project final environmental impact statement volume II. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 182 p. Report No. BOEM 2021-0012.

Bureau of Ocean Energy Management (BOEM). 2022. Ocean Wind Offshore Wind Farm biological assessment for the United States Fish and Wildlife Service. Submitted to the United States Fish and Wildlife Service by U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 186 p.

Davies TW, Bennie J, Gaston KJ. 2012. Street lighting changes the composition of invertebrate communities. Biology Letters 8(5):764-767. 10.1098/rsbl.2012.0216.

Department of the Navy (DoN). 2018. Final environmental impact statement/overseas environmental impact statement. Hawaii-Southern California training and testing. United States Department of the Navy. 854 p. https://media.defense.gov/2020/May/13/2002299466/-1/-1/1/00A-AFFTEIS-FEIS-ABSTRACT.PDF.

Dominion. 2022. Dominion Energy CVOW pilot project: avian and bat protection progress report RAPR condition 4.3.3.1 (March 29, 2022). 8 p. [accessed 2022 Jun 09]. https://energy.virginia.gov/offshore-wind/documents/July%20Presentations/Dominion%20CVOW%20update.pdf.

Dowling Z, Sievert PR, Baldwin E, Johnson L, Oettingen SV, Reichard J. 2017. Flight activity and offshore movements of nano-tagged bats on Martha's Vineyard, MA. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management. 43 p. Report No. BOEM 2017-054.

ESS Group Inc. 2014. Cape Wind avian & bat pre-construction monitoring report: 2013-2014. Prepared for Cape Wind Associates. 57 p. [accessed 2022 Jun 09]. https://www.boem.gov/renewable-energy/studies/cape-wind.

Griffin DR. 1940. Migrations of New England bats. Bulletin of the Museum of Comparative Zoology. 96:217-246.

Hatch SK, Connelly EE, Divoll TJ, Stenhouse IJ, Williams KA. 2013. Offshore observations of eastern red bats (*Lasiurus borealis*) in the mid-Atlantic United States using multiple survey methods. PLOS ONE 8(12):e83803.

Jackson N, Schwager K. 2012. Identification of bat species in Suffolk County. Upton, New York: Office of Science, Science Undergraduate Laboratory Internship (SULI) and Brookhaven National Laboratory. 16 p. [accessed 2022 Jun 09]. https://www.bnl.gov/esd/wildlife/files/research/pdf/2012jacksonpaper.pdf.

Luo J, Clarin BM, Borissov IM, Siemers BM. 2014. Are torpid bats immune to anthropogenic noise? Journal of Experimental Biology 217(7):1072-1078. 10.1242/jeb.092890.

National Park Service (NPS). 2018. Threatened and endangered species. National Park Service, Fire Island National Seashore. [updated 2018 May 02; accessed 2022 Jun 09]. https://www.nps.gov/fiis/learn/nature/threatened-and-endangered-species.htm.

New York Department of Environmental Conservation (NYSDEC). 2017. Species status assessment for tricolored bat. New York State Department of Environmental Conservation. 18 p. [accessed 2022 Jun 09]. https://www.dec.ny.gov/animals/7494.html.

New York State Energy Research and Development Authority (NYSERDA). 2017. New York State offshore wind master plan: birds and bats study. Albany (NY): Prepared for NYSERDA by Ecology and Environment Engineering, P.C. 142 p. Report No.: NYSERDA 17-25d.

Pelletier SK, Omland K, Watrous KS, Peterson TS. 2013. Information synthesis on the potential for bat interactions with offshore wind facilities – final report. Herndon (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 112 p. Report No.: BOEM 2013-01163.

Peterson TS, Pelletier SK. 2016. Long-term bat monitoring on islands, offshore structures, and coastal sites in the Gulf of Maine, mid-Atlantic, and Great Lakes—final report. Prepared for U.S. Department of Energy by Stantec Consulting Services Inc. 171 p. https://www.osti.gov/servlets/purl/1238337.

Peurach SC. 2003. High-altitude collision between an airplane and a hoary bat, *Lasiurus cinereus*. Bat Research News 44(1):2-3.

Poissant JA. 2009. Roosting and social ecology of the tricolored bat, *Perimyotis subflavus*, in Nova Scotia [Master's degree]. [Halifax, Nova Scotia]: Saint Mary's University. [accessed 2022 Jun 09]. https://library2.smu.ca/bitstream/handle/01/25150/poissant_joseph_a_masters_2009.PDF?sequence=2.

Roemer C, Disca T, Coulon A, Bas Y. 2017. Bat flight height monitored from wind masts predicts mortality risk at wind farms. Biological Conservation 215:116-122. 10.1016/j.biocon.2017.09.002.

Schaub A, Ostwald J, Siemers BM. 2008. Foraging bats avoid noise. Journal of Experimental Biology 211(19):3174-3180.

Sherwin HA, Montgomery WI, Lundy MG. 2013. The impact and implications of climate change for bats. Mammal Review 43(3):171-182.

Simmons AM, Hom KN, Warnecke M, Simmons JA. 2016. Broadband noise exposure does not affect hearing sensitivity in big brown bats (*Eptesicus fuscus*). Journal of Experimental Biology. 219(7):1031-1040.

Smith AD, McWilliams SR. 2016. Bat activity during autumn relates to atmospheric conditions: implications for coastal wind energy development. Journal of Mammalogy 97(6):1565–1577. 10.1093/jmammal/gyw116.

Solick DI, Newman CM. 2021. Oceanic records of North American bats and implications for offshore wind energy development in the United States. Ecology and Evolution 11:14433– 14447.

Stantec Consulting Services Inc. (Stantec). 2016. Long-term bat monitoring on islands, offshore structures, and coastal sites in the Gulf of Maine, mid-Atlantic, and Great Lakes—final report. Topsham (ME): U.S. Department of Energy. 171 p. https://www.osti.gov/servlets/purl/1238337.

Stantec Consulting Services Inc. (Stantec). 2018a. Avian and bat risk assessment for the construction and operations plan for South Fork Wind Farm. Prepared for Deepwater Wind South Fork, LLC by Stantec Consulting Services Inc., Topsham, ME.

Stantec Consulting Services Inc. (Stantec). 2018b. Avian and bat risk assessment: South Fork Wind Farm and South Fork Export Cable. Prepared for Deepwater Wind South Fork, LLC by Stantec Consulting Services Inc., Topsham, ME.

Stantec Consulting Services Inc. (Stantec). 2018c. Vessel-based acoustic bat monitoring: South Fork Wind Farm and South Fork Export Cable. Prepared for Deepwater Wind Block Island, LLC, Providence, RI by Stantec Consulting Services Inc., Topsham, ME.

Stantec Consulting Services Inc. (Stantec). 2022. Avian and bat risk assessment. Appendix P1 in Construction and operations plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. August 2022.

Stegemann E, Hicks A. n.d. Bats of New York. New York State Department of Environmental Conservation. 4 p. [accessed 2022 Feb 16]. https://www.dec.ny.gov/docs/administration _pdf/batsofny.pdf.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

True MC, Reynolds RJ, Ford WM. 2021. Monitoring and modeling tree bat (Genera: *Lasiurus, Lasionycteris*) occurrence using acoustics on structures off the mid-Atlantic coast - implications for offshore wind development. Animals (11):3146.

United States Fish and Wildlife Service (USFWS). 2021. ECOS: Indiana bat (*Myotis sodalis*). [accessed 2022 Feb 16]. https://ecos.fws.gov/ecp/species/5949.

K.3.5. Section 3.7 – Benthic Resources

AKRF Inc., AECOM, Popper A. 2012. Essential fish habitat assessment for the Tappan Zee Hudson River Crossing Project, Rockland and Westchester Counties, New York and the Historic Area Remediation Site, New York Bight Apex.

Albert L, Deschamps F, Jolivet A, Olivier F, Chauvaud L, Chauvaud S. 2020. A current synthesis on the effects of electric and magnetic fields emitted by submarine power cables on invertebrates. Marine Environmental Research 159:104958-104958.

Albert L, Maire O, Olivier F, Lambert C, Romero-Ramirez A, Jolivet A, Chauvaud L, Chauvaud S. 2022. Can artificial magnetic fields alter the functional role of the blue mussel, Mytilus edulis? Marine Biology 169:75 (2022).

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions. Renewable and Sustainable Energy Reviews 96 (2018):380–391.

Bethoney N, Stokesbury K. 2019. Implications of extremely high recruitment: crowding and reduced growth within spatial closures. Marine Ecology Progress Series 611:157–165.

Betke K, Glahn MS, Matuschek R. 2004. Underwater noise emissions from offshore wind turbines. Joint Congress CFA/DAGA; March 22-25; Strasbourg, France.

Bokuniewicz HJ, Tanski JJ, Bocamazo L. 2011. Sand resources offshore of Long Island (NY). Coastal Sediments; May 2-6; Miami, Florida. 1021-1033 p.

Broad A, Rees MJ, Davis AR. 2020. Anchor and chain scour as disturbance agents in benthic environments: trends in the literature and charting a course to more sustainable boating and shipping. Marine Pollution Bulletin 161: 111683.

Brooks RA, Purdy CN, Bell SS, Sulak KJ. 2006. The benthic community of the Eastern U.S. continental shelf: a literature synopsis of benthic faunal resources. Continental Shelf Research 26:804-818.

Bureau of Ocean Energy Management (BOEM). 2013. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Rhode Island and Massachusetts. Revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 417 p. Report No. OCS EIA/EA BOEM 2013-1131.

Bureau of Ocean Energy Management (BOEM). 2015. Virginia offshore wind technology advancement project on the Atlantic outer continental shelf offshore Virginia revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No. BOEM 2015-031.

Bureau of Ocean Energy Management (BOEM). 2019. Guidelines for providing benthic habitat survey information for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR part 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 9 p.

Bureau of Ocean Energy Management (BOEM). 2023. Essential fish habitat assessment for Sunrise Wind Offshore Wind Project. May 2023. Submitted to National Marine Fisheries Service by U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Program.

Carey DA, Wilber DH, Read LB, Guarinello ML, Griffin M, Sabo S. 2020. Effects of the Block Island Wind Farm on coastal resources: lessons learned. Oceanography 33(4):70-81.

Carroll AG, Przeslawski R, Duncan A, Gunning M, Bruce B. 2016. A critical review of the potential impacts of marine seismic surveys on fish & invertebrates. Marine Pollution Bulletin 114(1):9-24.

Chen C, Beardsley RC, Qi J, Lin H. 2016. Use of finite-volume modeling and the northeast coastal ocean forecast system in offshore wind energy resource planning. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 131 p. Report No.: BOEM 2016-050.

Chen L, Coolen JWP, Scherer L, Mogollón JM, Braeckman U, Vanaverbeke J, Tukker A, Steubing B. 2023. Offshore wind energy and marine biodiversity in the North Sea: life cycle impact assessment for benthic communities. Environmental Science & Technology 57 (16): 6455-6464.

Chen Z, Curchitser E, Chant R, Kang D. 2018. Seasonal variability of the cold pool over the Mid-Atlantic Bight continental shelf. Journal of Geophysical Research: Oceans 123(11):8203-8226.

Dalyander PS, Butman B, Sherwood CR, Signell RP, Wilkin JL. 2013. Characterizing wave- and current-induced bottom shear stress: U.S. middle Atlantic continental shelf. Continental Shelf Research 52: 73-85.

Dean M, DeCelles G, Zemeckis D, Ames T. 2022. Early life history: spawning to settlement. Chapter 2 in R.S. McBride and R.K. Smedbol (eds). An interdisciplinary review of Atlantic cod (*Gadus morhua*) stock structure in the western north Atlantic Ocean. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NE-XXX (in press). 251 p.

De Backer A, Hostens K. 2017. Effects of Belgian offshore wind farms on soft sediment epibenthos and fish: an updated time series. Brussels, Belgium: Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management Section: 59-71.

Degraer S, Brabant R, Rumes B, Vigin L. 2019. Environmental impacts of offshore wind farms in the Belgian part of the North Sea: marking a decade of monitoring, research and innovation. Brussels, Belgium: Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management. 104 p.

Degraer S, Carey DA, Coolen JP, Hutchison ZL, Kerckhof F, Rumes B, and Vanaverbeke J. 2020. Offshore wind farm artificial reefs affect ecosystem structure and functioning: A synthesis. Oceanography 33(4):48–57.

De Mesel I, Kerckhof F, Norro A, Rumes B, Degraer S. 2015. Succession and seasonal dynamics of the epifauna community on offshore wind farm foundations and their role as stepping stones for non-indigenous species. Hydrobiologia 756(1): 37-50.

Dernie KM, Kaiser MJ, Warwick RM. 2003. Recovery rates of benthic communities following physical disturbance. Journal of Annual Ecology 72(6):1043-1056.

DNV GL. 2021. Certified Verification Agent Confidential. Appendix D in Construction and operations plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. Medford, Massachusetts: DNV-GL.

Edmonds NJ, Firmin CJ, Goldsmith D, Faulkner RC, Wood DT. 2016. A review of crustacean sensitivity to high amplitude underwater noise: data needs for effective risk assessment in relation to UK commercial species. Marine Pollution Bulletin 108(1):5-11.

Elliott J, Khan AA, Ying-Tsong L, Mason T, Miller JH, Newhall AE, Potty GR, Vigness-Raposa KJ. 2019. Field observations during wind turbine operations at the Block Island Wind Farm, Rhode Island. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 281 p. Report No. BOEM 2019-028.

Elliot J, Smith K, Gallien D, Khan A. 2017. Observing cable laying and particle settlement during the construction of the Block Island Wind Farm. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 226 pp. Report No. BOEM 2017-027.

Exponent Engineering P.C. (Exponent Engineering). 2022. Offshore DC and AC electric-and magnetic field assessment. Appendix J1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Federal Geographic Data Committee (FGDC). 2012. Coastal and marine ecological classification standard. Reston, Virginia. [accessed 2022 Jan 09]. https://www.ncei.noaa.gov/products/coastal-marine-ecological-classification-standard.

Fortune IS, Paterson DM. 2020. Ecological best practice in decommissioning: a review of scientific research. ICES Journal of Marine Science 77(3):1079-1091.

Fugro. 2021. Integrated geophysical and geotechnical site characterization report, South Fork Wind Farm and Export Cable, South Fork Wind Farm survey offshore NY/RI/MA Atlantic OCS. Report No. 02.1803-1431-02.

Gardline J. 2021. Sunrise Wind Farm individual boulders within boulder fields (2019, 2020). Geophysical 1B Survey Interpretation Report, Sunrise Wind Farm Project.

Germano J, Parker J, Charles J. 1994. Monitoring cruise at the Massachusetts Bay disposal site, August 1990. Waltham, Massachusetts: U.S. Army Corps of Engineers. Report No. DAMOS Contribution No. 92.

Gill AB, Gloyne-Philips I, Kimber J, Sigray P. 2014. Marine renewable energy, electromagnetic (EM) fields and EM-sensitive animals. In: Sheilds M, Payne A (eds). Marine renewable energy technology and environmental interactions. Humanity and the Sea. Cham, Switzerland: Springer, Dordrecht.

Gill A, Gloyne-Philips I, Neal K, Kimber J. 2005. The potential effects of electromagnetic fields generated by sub-sea power cables associated with offshore wind farm developments on electrically and magnetically sensitive marine organisms - a review. Report No. COWRIE-EM FIELD 2-06-2004. Final report. Prepared for Collaborative Offshore Wind Research into the Environment. Cranfield University and the Centre for Marine and Coastal Studies Ltd. 128 p.

Guarinello ML, Carey DA. 2020. Multi-modal approach for benthic impact assessments in moraine habitats: a case study at the Block Island Wind Farm. Estuaries and Coasts 45:1107-1122.

Guida V, Drohan A, Welch H, McHenry J, Johnson D, Kentner V, Brink J, Timmons D, Estela-Gomez E. 2017. Habitat mapping and assessment of Northeast wind energy areas. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No. BOEM 2017-088.

Harsanyi P, Scott K, Easton BA, de la Cruz Ortiz G, Chapman EN, Piper AR, Rochas CV, Lyndon AR. 2022. The effects of anthropogenic electromagnetic fields (EMF) on the early development of two commercially important crustaceans, European lobster, *Homarus gammarus* (L.) and edible crab, *Cancer pagurus* (L.). J. Mar. Sci. Eng. 10(5):564-581.

Hawkins AD, Popper AN. 2014. Assessing the impact of underwater sounds on fishes and other forms of marine life. Acoustics Today 10(2):30-41.

Hawkins AD, Hazelwood RA, Popper AN, Macey PC. 2021. Substrate vibrations and their potential effects upon fishes and invertebrates. The Journal of the Acoustical Society of America 149(4): 2782-2790.

Hirsch ND, DiSalvo LH, Peddicord R. 1978. Effects of dredging and disposal on aquatic organisms. Vicksburg, Mississippi: U.S. Army Corps of Engineers. Technical Report DS-78-5.

Hutchison ZL, Bartley ML, Degraer S, English P, Khan A, Livermore J, Rumes B, King JW. 2020a. Offshore wind energy and benthic habitat changes: lessons from Block Island wind farm. Oceanography 33(4):58-69.

Hutchison ZL, Gill AB, Sigray P, He H, King JW. 2020b. Anthropogenic electromagnetic fields (EMF) influence the behaviour of bottom-dwelling marine species. Scientific Reports 10(1):4219.

Hutchison ZL, Sigray P, He H, Gill A, King J, Gibson C. 2018. Electromagnetic field (EMF) impacts on elasmobranch (shark, rays, and skates) and American lobster movement and migration from direct current cables. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 254 p. Report No. BOEM 2018-003.

Inspire Environmental (Inspire). 2019. Ichthyoplankton and zooplankton assessment: jet plow entrainment report. South Fork Wind Farm. Prepared for Jacobs Engineering Group and South Fork Wind Farm.

Inspire Environmental (Inspire). 2022a. Benthic resources characterization report – federal waters Appendix M1 in Construction and operations plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. July 2022.

Inspire Environmental (Inspire). 2022b. Benthic resources characterization report – New York State waters. Appendix M2 in Construction and operations plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. July 2022.

Inspire Environmental (Inspire). 2022c. Benthic habitat mapping to support essential fish habitat consultation. Appendix M3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Jakubowska-Lehrmann M, Białowąs M, Otremba Z, Hallmann A, Śliwińska-Wilczewska S, Urban-Malinga B. 2022. Do magnetic fields related to submarine power cables affect the functioning of a common bivalve? Marine Environmental Research 179. 105700, ISSN 0141-1136,10.1016/j.marenvres.2022.105700.

Jézéquel Y, Cones S, Jensen FH, Brewer H, Collins J, Mooney TA. (2022). Pile driving repeatedly impacts the giant scallop (*Placopecten magellanicus*). Scientific Reports 12(1): 15380–15380.

Johnson JH, Dropkin DS, Warkentine BE, Rachlin JW, Andrews WD. 1997. Food habits of Atlantic sturgeon off the central New Jersey coast. Transactions of the American Fisheries Society 126(1):166-170.

Johnson TL, van Berkel JJ, Mortensen LO, Bell MA, Tiong I, Hernandez B, Snyder DB, Thomsen F, Svenstrup Petersen O (DHI Water & Environment, Inc., Lakewood, CO). 2021. Hydrodynamic modeling, particle tracking and agent-based modeling of larvae in the U.S. mid-Atlantic Bight. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 232 p. Report No.: OCS Study BOEM 2021-049.

Jones IT, Peyla JF, Clark H, Song Z, Stanley JA, Mooney TA. 2021. Changes in feeding behavior of longfin squid (*Doryteuthis pealeii*) during laboratory exposure to pile driving noise. Marine Environmental Research 165:105250.

Jones IT, Stanley JA, Mooney TA. 2020. Impulsive pile driving noise elicits alarm responses in squid (*Doryteuthis pealeii*). Marine Pollution Bulletin 150:110792.

Kenny AJ, Rees HL. 1994. The effects of marine gravel extraction on the macrobenthos: early post-dredging recolonization. Marine Pollution Bulletin 28(7):442-447.

Kikuchi R. 2010. Risk formulation for the sonic effects of offshore wind farms on fish in the EU region. Marine Pollution Bulletin 60(2):172-177.

Kohut J, Brodie J. 2019. Partners in science workshop: offshore wind and the Mid-Atlantic cold pool. Tuckerton, New Jersey: Jacques Cousteau National Estuarine Research Reserve. 15 p.

Kraus C, Carter L. 2018. Seabed recovery following protective burial of subsea cables - observations from the continental margin. Ocean Engineering 157:251-261.

Lentz SJ. 2017. Seasonal warming of the middle Atlantic bight cold pool. Journal of Geophysical Research Oceans 122(2):941-954.

Love M, Nishimoto M, Clark S, Bull A. 2015. Identical response of caged rock crabs (Genera Metacarcinus and Cancer) to energized and unenergized undersea power cables in Southern California, U.S.A. Bulletin of the Southern California Academy of Sciences 114(1):33-41.

Love M, Nishimoto M, Clark S, Bull A. 2016. Renewable energy in situ power cable observation. Santa Barbara: University of California. 106 p.

Love MS, Nishimoto MM, Clark S, McCrea M, Bull AS. 2017. Assessing potential impacts of energized submarine power cables on crab harvests. Continental Shelf Research 151:23-29.

Maurer D, Keck RT, Tinsman JC, Leathem WA, Wethe C, Lord C, Church TM. 1986. Vertical migration and mortality of marine benthos in dredged material: a synthesis. Internationale Revue der gesamten Hydrobiologie und Hydrographie. 71(1):49-63.

Methratta ET, Dardick WR. 2019. Meta-analysis of finfish abundance at offshore wind farms. Reviews in Fisheries Science and Aquaculture 27(2):242-260.

Minerals Management Service (MMS). 2007. Final programmatic environmental impact statement for alternative energy development and production and alternate use facilities on the outer continental shelf. 1,780 p. OCS Publication No. 2007-046.

Minerals Management Service (MMS). 2009. Cape Wind energy project final environmental impact statement (FEIS). 800 p. OCS Publication No. 2008-040.

Nation Marine Fisheries Service (NMFS). 2015. Endangered species section 7 consultation biological opinion Deepwater Wind: Block Island Wind Farm and Transmission System. NOAA Fisheries. Report No. NER-2015-12248.

National Oceanic and Atmospheric Administration (NOAA). 2017. Magnuson-Stevens Fishery Conservation and Management Act provisions; Fisheries of the northeastern United States; essential fish habitat; Final rule. 46749-46752 p.

National Oceanic and Atmospheric Administration (NOAA). 2021. State of the ecosystem 2021: Mid-Atlantic revised. United States. National Marine Fisheries Service. Northeast Fisheries Science Center. [accessed 2022 Jan 27]. https://repository.library.noaa.gov/view/noaa/29525.

New England Fisheries Management Council (NEFMC). 2018. NMFS approves "majority" of council's habitat amendment. NEFMC Press Release January 8, 2018. [accessed 2022 Jan 27]. https://www.nefmc.org/news/nmfs-approves-majority-of-councils-habitat-amendment.

New York State Energy Research and Development Authority (NYSERDA). 2017. New York State offshore wind master plan analysis of multibeam echo sounder and benthic survey data final report. NYSERDA Report 17-25a.

Normandeau Associates. 2014. Understanding the habitat value and function of shoal/ridge/trough complexes to fish and fisheries on the Atlantic and Gulf of Mexico outer continental shelf. Bedford, New Hampshire: U.S. Department of the Interior, Bureau of Ocean Energy Management. 116 p.

Ørsted Offshore North America. 2023. Feasibility study for wind turbine generator monopile foundations confidential. Appendix G3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. June 2023.

Payne J, Andrews C, Fancey L, Cook A, Christian J. 2007. Pilot study on the effects of seismic air gun noise on lobster (*Homarus americanus*). Environmental Studies Research Fund Report No. 171. St Johns, NL. 34 p.

Pinsky ML, Selden RL, Kitchel ZJ. 2020. Climate-driven shifts in marine species ranges: scaling from organisms to communities. Annual Review of Marine Science 12: 153-179.

Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol SM, Carlson T, Coombs S, Ellison WT, Gentry RL, Halvorsen M, Lokkeborg S, Rogers PH, Southall B, Zeddies DG, Tavolga WN. 2014. Sound exposure guidelines. ASA S3/SC1.4 TR-2014 sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. Springer Briefs in Oceanography. Springer, Cham.

Raoux A, Tecchio S, Pezy J-P, Lassalle G, Degraer S, Wilhelmsson D, Cachera M, Ernande B, Le Guen C, Haraldsson M, Grangeré K, Le Loc'h F, Dauvin J, Niquil, N. 2017. Benthic and fish aggregation inside an offshore wind farm: Which effects on the trophic web functioning? Ecological Indicators 72: 33-46.

Roberts L, Cheesman S, Breithaupt T, Elliott M. 2015. Sensitivity of the mussel Mytilus edulis to substrate borne vibration in relation to anthropogenically generated noise. Marine Ecology Progress Series 538: 185-195.

Roberts L, Elliott M. 2017. Good or bad vibrations? Impacts of anthropogenic vibration on the marine epibenthos. The Science of the Total Environment 595:255-268.

Schultze LP, Merckelbach LM, Horstmann J, Raasch S, Carpenter JR. 2020. Increased mixing and turbulence in the wake of offshore windfarm foundations. Journal of Geophysical Research: Oceans 125(8): 1-15.

Schwab WC, Thieler ER, Denny JF, Danforth WW. 2000. Sea-floor sediment distribution off southern Long Island, New York. Report No.: 2000-243.

Scott K, Piper AR, Chapman EN, Rochas CV. 2020. Review of the effects of underwater sound, vibration and electromagnetic fields on crustaceans. Seafish report. https://www.researchgate.net/profile/Kevin_Scott23/publication/349173743_Review_of_the_effects_of_underwater_sound_vibration_and_electromagnetic_fields_on_crustaceans/links/6023cccd458515893995a1a3/Review-of-the-effects-of-underwater-sound-vibration-and-electromagnetic-fields-on-crustaceans.pdf.

Snyder DB, Bailey WH, Palmquist K, Cotts BRT, Olsen KR. 2019. Evaluation of potential EMF effects on fish species of commercial or recreational fishing importance in southern New England. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No. BOEM 2019-049. 62 p.

Stöber U, Thomsen F. 2021. How could operational underwater sound from future offshore wind turbines impact marine life? J Acoust Soc Am. 149(3):1791-1795.

Sunrise Wind LLC (Sunrise Wind). 2023a. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sunrise Wind LLC (Sunrise Wind). 2023b. Boulder relocation plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted in response to RFI received on January 11, 2023. February 2023.

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: knowledge gaps, recommendations, and future directions. Renewable and Sustainable Energy Reviews 96:380-391.

Tougaard J, Hermannsen L, Madsen PT. 2020. How loud is the underwater noise from operating offshore wind turbines? J Acoust Soc Am. 148(5):2885-2893.

TRC Companies, Inc. (TRC). 2021. United States Environmental Protection Agency national pollutant discharge elimination system (NPDES) permit application. Sunrise Wind offshore converter station. Submitted to U.S. Environmental Protection Agency in December 2021.

TRC. 2023. Ichthyoplankton entrainment assessment. Appendix N2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

United Kingdom Department for Business Enterprise and Regulatory Reform. 2008. Review of cabling techniques and environmental effects applicable to the offshore wind industry. Report No. Technical Report 2008. https://tethys.pnnl.gov/publications/review-cabling-techniques-environmental-effects-applicable-offshore-wind-farm-industry.

United States Army Corps of Engineers (USACE). 2022. Fact sheet-Long Island Intracoastal Waterway, New York - federal navigation channel. Maintenance and stewardship. [accessed 2022 Jan 27]. https://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487513/fact-sheet-long-island-intracoastal-waterway-new-york-federal-navigation-channel/.

van Berkel J, Burchard H, Christensen A, Mortensen LO, Petersen OS, Thomsen F. 2020. The effects of offshore wind farms on hydrodynamics and implications for fishes. Oceanography 33(4): 108–117.

Williams SJ. 1976. Geomorphology, shallow subbottom structure, and sediments of the Atlantic inner continental shelf off Long Island, New York. Report No.: Technical Paper No. 76-2. https://www.biodiversitylibrary.org/item/101891#page/3/mode/1up.

Woodruff DL, Ward JA, Schultz IR, Cullinan VI, Marshall KE. 2012. Effects of electromagnetic fields on fish and invertebrates, Task 2.1.3: effects on aquatic organisms, fiscal year 2011 progress report on the environmental effects of marine and hydrokinetic energy. Richland, Washington: U.S. Department of Energy, Pacific Northwest National Laboratory. PNNL-20813. 68 p.

Woods Hole Group. 2022. Sediment transport modeling report. Appendix H in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

K.3.6. Section 3.8 – Birds

Baker A, Gonzalez P, Morrison RIG, Harrington BA. 2013. Red knot (*Calidris canutus*), version 2.0.Poole. The birds of North America. Ithaca (NY): Cornell Lab of Ornithology.

Band W. 2012. Using a collision risk model to assess bird collision risks for offshore windfarms. The Crown Estate Strategic Ornithological Support Services. Report No. SOSS-02.

Bay State Wind. 2019. Construction and operations plan, Volume II: Site characterization and assessment of impact-producing factors and list of references. Submitted to BOEM March 15, 2019, Revised June 28, 2019. https://www.boem.gov/renewable-energy/state-activities/us-wind-construction-and-operations-plan.

Bennun L, van Bochove J, Ng C, Fletcher C, Wilson D, Phair N, Carbone G. 2021. Mitigating biodiversity impacts associated with solar and wind energy development, guidelines for project developers. Gland (Switzerland) Cambridge (UK): International Union for Conservation of Nature and Natural Resources and the Biodiversity Consultancy. 260 p.

Briggs KT, Gershwin ME, Anderson DW. 1997. Consequences of petrochemical ingestion and stress on the immune system of seabirds. ICES Journal of Marine Science 54(4):718–725.

Bureau of Ocean Energy Management (BOEM). 2012. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Massachusetts: environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 396 p. Report No. BOEM 2012-087.

Bureau of Ocean Energy Management (BOEM). 2014. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Massachusetts: revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 674 p.

Bureau of Ocean Energy Management (BOEM). 2016. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore New York: environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 352 p. Report No. BOEM 2016-042.

Bureau of Ocean Energy Management (BOEM). 2019. Draft proposed guidelines for providing information on lighting and marking of structures supporting renewable energy development. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 9 p.

Bureau of Ocean Energy Management (BOEM). 2021a. South Fork Wind Farm and South Fork Export Cable Project biological assessment for the National Marine Fisheries Service. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 134 p.

Bureau of Ocean Energy Management (BOEM). 2021b. Vineyard Wind Offshore Wind Energy Project: final environmental impact statement. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 352 p. Report No. BOEM 2021-0012.

Bureau of Ocean Energy Management (BOEM). 2022a. Draft environmental assessment commercial wind lease and grant issuance and site assessment activities on the Pacific outer continental shelf, Humboldt Wind Energy Area, California. Camarillo, CA: U.S. Department of the Interior, Bureau of Ocean Energy Management. 92 p. Report No. BOEM 2021-87.

Bureau of Ocean Energy Management (BOEM). 2022b. Ocean Wind Offshore Wind Farm biological assessment for the United States Fish and Wildlife Service. Submitted to the United States Fish and Wildlife Service by U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 186 p.

Causon PD, Gill AB. 2018. Linking ecosystem services with epibenthic biodiversity change following installation of offshore wind farms. Environmental Science and Policy 89:340–347.

Degraer S, Carey DA, Coolen JWP, Hutchison ZL, Kerckhof F, Rumes B, Vanaverbeke J. 2020. Offshore wind farm artificial reefs affect ecosystem structure and functioning. Oceanography 33(4): 48-57.

Dolbeer RA, Begier MJ, Miller PR, Weller JR, Anderson AL. 2021. Wildlife strikes to civil aircraft in the United States, 1990-2019. Washington, D.C.: Report No.: Serial Report Number 26.

Efroymson RA, Rose WH, Nemeth S, Suter II GW. 2000. Ecological risk assessment framework for low-altitude overflights by fixed-wing and rotary-wing military aircraft. Oak Ridge (TN): Oak Ridge National Laboratory. 115 p. Report No. ORNL/TM-2000/289 ES-5048.

Elliot JB, Smith K, Gallien DR, Khan AA. 2017. Observing cable laying and particle settlement during the construction of the Block Island Wind Farm. Final report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 225 p. OCS Study BOEM 2017-027.

English PA, Mason TI, Backstrom JT, Tibbles BJ, Mackay AA, Smith MJ, Mitchell T. 2017. Improving efficiencies of National Environmental Policy Act documentation for offshore wind facilities: case studies report. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 296 p. Report No. BOEM 2017-026.

Fox AD, Petersen IK. 2019. Offshore wind farms and their effects on birds. Dansk Ornitologisk Forenings Tidsskrift 113:86-101.

Gilbert AT, Adams EM, Loring P, Williams KA. 2022. User documentation for the stochastic collision risk assessment for movement (SCRAM). Developed by Biodiversity Research Institute, University of Rhode Island, and U.S. Fish and Wildlife Service with funding from the Bureau of Ocean Energy Management. [accessed 2022 Feb 12]. https://briwildlife.org/scram/.

Gochfeld M, Burger J. 2020. Roseate tern *(Sterna dougallii*), Version 1.0. Ithaca, NY: Cornell Lab of Ornithology. [accessed 2022 Feb 12]. https://birdsoftheworld.org/bow/species/roster/cur/introduction.

Haney JC, Jodice PGR, Montevecchi WA, Evers DC. 2017. Challenges to oil spill assessment for seabirds in the deep ocean. Archives of Environmental Contamination and Toxicology 73:33-39.

Hansen KA, Hernandez A, Mooney TA, Rasmussen MH, Sørensen K, Wahlberg M. 2020. The common murre (*Uria aalge*), an auk seabird, reacts to underwater sound. The Journal of the Acoustical Society of America 147(6):4069-4074.

Homer C, Dewitz J, Yang L, Jin S, Danielson P, Xian G, Coulston J, Herold N, Wickham J, Megown K. 2015. Completion of the 2011 national land cover database for the conterminous United States-representing a decade of land cover change information. Photogrammetric Engineering and Remote Sensing 81(5):345-354.

Hüppop O, Dierschke J, Exo K-M, Fredrich E, Hill R. 2006. Bird migration studies and potential collision risk with offshore wind turbines. Ibis 148:90-109.

International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). 2013. IALA recommendation O-139 – the marking of man-made offshore structures. Edition 2, December 2013. [accessed 2020 Jul].https://www.iala-aism.org/product/marking-of-man-made-offshore-structures-o-139/.

Jennings K. 2018. 2018 Long Island colonial waterbird & piping plover update. Harbor herons & other waterbirds of the greater NY/NJ harbor working group: presentation. New York Department of Environmental Conservation. [accessed 2022 Feb 12]. https://www.hudsonriver.org/wp-content/uploads/2017/11/ Jennings_NYSDEC-Region1_LI-Update_2018.pdf.

Kerlinger P, Gehring JL, Erickson WP, Curry R, Jain A, Guarnaccia J. 2010. Night migrant fatalities and obstruction lighting at wind turbines in North America. Wilson Journal of Ornithology 122(4):744-754.

Kleist NJ, Guralnick RP, Cruz A, Lowry CA, Francis CD. 2018. Chronic anthropogenic noise disrupts glucocorticoid signaling and has multiple effects on fitness in an avian community. PNAS. 115(4):E648-E657.

Komenda-Zehnder S, Cevallos M, Bruderer B. 2003. Effects of disturbance by aircraft overflight on waterbirds – an experimental approach. In: International Bird Strike Committee IBSC26/WP-LE2; 2003 May 5-9; Warsaw (Poland). 12 p.

Kühn S, Bravo-Rebolledo EL, van Franeker JA. 2015. Deleterious effects of litter on marine life. In: Bergmann M, Gutow L, Klages M (eds). Marine anthropogenic litter. Cham, Switzerland: Springer International Publishing. p. 75-116.

Loring PH, McLaren JD, Smith PA, Niles LJ, Koch SL, Goyert HF, Bai H. 2018. Tracking movements of threatened migratory rufa red knots in U.S. Atlantic Outer Continental Shelf waters. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 147 p. Report No.: BOEM 2018-046.

Loring PH, Paton PWC, McLaren JD, Bai H, Janaswamy R, Goyert HF, Griffin CR, Sievert PR. 2019. Tracking offshore occurrence of common terns, endangered roseate terns, and threatened piping plovers with VHF arrays. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 158 p. Report No.: BOEM 2019-017.

Loss S, Will T, Marra P. 2013. The impact of free-ranging domestic cats on wildlife of the United States. Nat Commun 4:1396.

Maggini I, Kennedy LV, Macmillan A, Elliot KH, Dean K, Guglielmo CG. 2017. Light oiling of feathers increases flight energy expenditure in a migratory shorebird. Journal of Experimental Biology 220:2372-2379.

Madsen EA, Reeve R, Desholm M, Fox AD, Furness RD, Haydon TD. 2012. Assessing the impact of marine wind farms on birds through movement modelling. Journal of the Royal Society Interface 9:2120–2130.

McGrew KA, Crowell SE, Fiely JL, Berlin AM, Olsen GH, James J, Hopkins H, Williams CK. 2022. Underwater hearing in sea ducks with applications for reducing gillnet bycatch through acoustic deterrence. Journal of Experimental Biology 225(20). 10.1242/jeb.243953.

Menza C, Kinlan BP, Dorfman DS, Poti M, Caldow C (Eds). 2012. A biogeographic assessment of seabirds, deep sea corals and ocean habitats of the New York Bight: science to support offshore spatial planning. Silver Spring (MD): National Centers for Coastal Ocean Science. 224 p. Report No.: NOAA Technical Memorandum NOS NCCOS 141.

National Park Service (NPS). 2018. Threatened and endangered species. National Park Service, Fire Island National Seashore. [updated 2018 May 02; accessed 2022 Jun 09]. https://www.nps.gov/fiis/learn/nature/threatened-and-endangered-species.htm.

New York State Department of Environmental Conservation (NYSDEC). 2007. New York State breeding bird atlas. 2000–2005. Albany, NY:. [accessed 2022 Feb 12]. http://www.dec.ny.gov/animals/7312.html.

New York State Department of Environmental Conservation (NYSDEC). 2014a. Species status assessment for red knot. New York State Department of Environmental Conservation. 12 p.

New York State Department of Environmental Conservation (NYSDEC). 2014b. Species status assessment for roseate tern. New York State Department of Environmental Conservation. 15 p.

New York State Department of Environmental Conservation (NYSDEC). 2017. Species status assessment for piping plover. New York State Department of Environmental Conservation. 18 p.

New York State Department of Environmental Conservation (NYSDEC). 2022. Habitats of New York State, ecoregions of New York. New York State Department of Environmental Conservation. [accessed 2022 Feb 12]. https://www.dec.ny.gov/animals/9402.html.

New York State Energy Research & Development Authority (NYSERDA). 2017a. New York State offshore wind master plan: birds and bats study. Albany (NY): Prepared for NYSERDA by Ecology and Environment Engineering, P.C. 142 p. Report No.: NYSERDA 17-25d.

New York State Energy Research & Development Authority (NYSERDA). 2017b. New York State offshore wind master plan: cable landfall permitting study. Albany (NY): Prepared for NYSERDA by Ecology and Environment Engineering, PC. 248 p. Report No.: NYSERDA 17-25e.

Niles LJ, Bart J, Sitters HP, Dey AD, Clark KE, Atkinson PW, Baker AJ, Bennett KA, Kalasz KS, Clark NA. 2009. Effects of horseshoe crab harvest in Delaware Bay on red knots: are harvest restrictions working? BioScience 59(2):153–164.

Nisbet ICT, Veit RR, Auer SA, White TP. 2013. Marine birds of the eastern United States and the Bay of Fundy: distribution, numbers, trends, threats, and management. Cambridge (MA): Nuttall Ornithological Club. [accessed 2022 Feb 20]. https://www.biodiversitylibrary.org/bibliography/192850.

Normandeau Associates, Inc. (Normandeau) and APEM, Inc. (APEM). 2021. Remote marine and onshore technology digital aerial baseline survey of marine wildlife in support of offshore wind energy. New York State Energy Research and Development Authority. [accessed 2022 Feb 20]. https://remote.normandeau.com/norm-apem.php.

Pangerc T, Robinson S, Theobald P, Galley L. 2016. Underwater sound measurement data during diamond wire cutting: First description of radiated noise. In Proceedings of the Fourth International Conference on the Effects of Noise on Aquatic Life. July 10–16. Dublin, Ireland. https://pubs.aip.org/asa/poma/article/27/1/040012/836909/Underwater-sound-measurement-data-during-diamond.

Paruk JD, Adams EM, Uher-Koch H, Kovach KA, D. Long I, Perkins C, Schoch N, Evers DC. 2016. Polycyclic aromatic hydrocarbons in blood related to lower body mass in common loons. Science of the Total Environment 565:360-368.

Peschko V, Mendel B, Müller S, Markones N, Mercker M, Garthe S. 2020. Effects of offshore windfarms on seabird abundance: strong effects in spring and in the breeding season. Marine Environmental Research. 162:105-157.

Peters KA. 2008. Avian inventory and monitoring needs for Fire Island National Seashore: a review of available literature and data. Prepared for National Park Service. Kingston, Rhode Island. 90 p.

Rebke M, Dierschke V, Weiner C, Aumüller R, Hill K, Hill R. 2019. Attraction of nocturnally migrating birds to artificial light: The influence of colour, intensity and blinking mode under different cloud cover conditions. Biological Conservation 233:220-227.

Roman L, Hardesty BD, Hindell MA, Wilcox C. 2019. A quantitative analysis linking seabird mortality and marine debris ingestion. Scientific Reports 9(1):1-7.

Sigourney DB, Orphanides CD, Hatch JM. 2019. Estimates of seabird bycatch in commercial fisheries off the east coast of the United States from 2015 to 2016. Woods Hole, Massachusetts: National Oceanic and Atmospheric Administration National Marine Fisheries Service. Report No.: NOAA Technical Memorandum NMFS-NE-252.

Smith KG, Wittenberg SR, Macwhirter RB, Bildstein KL. 2020. Northern harrier (*Circus hudsonius*), Version 1.0. Ithaca, NY: Cornell Lab of Ornithology. [accessed 2022 Jun 09]. https://birdsoftheworld.org/bow/species/norhar2/1.0/introduction.

Stantec Consulting Services Inc. (Stantec). 2018a. Avian and bat risk assessment for the construction and operations plan for South Fork Wind Farm. Topsham, Maine. https://southforkwind.com/.

Stantec Consulting Services Inc. (Stantec). 2018b. Avian and bat risk assessment: South Fork Wind Farm and South Fork Export Cable. Prepared for Deepwater Wind South Fork, LLC. Providence, RI. 224 p. https://southforkwind.com/

Stantec Consulting Services Inc. (Stantec). 2020. SFWF – Montauk O&M facility in-water work. Assessment of potential impacts to natural resources from in-water work. Prepared for Deepwater Wind South Fork, LLC Providence, RI. https://southforkwind.com/.

Stantec Consulting Services Inc. (Stantec). 2022a. Air traffic flow analysis/ADLA analysis. Appendix Y2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Stantec Consulting Services Inc. (Stantec). 2022b. Avian and bat risk assessment. Appendix P1 in Construction and operations plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. August 2022.

Sunrise Wind LLC (Sunrise Wind). 2022. Safety management system confidential. Appendix G1 in Construction and Operations Plan Sunrise Wind Farm. November 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Tanaka K, Takada H, Yamashito R, Mizukawa K, Fukuwaka M, Watanuki Y. 2013. Accumulation of plastic-derived chemicals in tissues of seabirds ingesting marine plastics. Marine Pollution Bulletin 69:219–222.

Teuten EL, Saquing JM, Knappe DRU, Barlaz MA, Jonsson S, Bjorn A, Rowland SJ, Thompson RC, Galloway TS, Yamashita R. 2009. Transport and release of chemicals from plastics to the environment and to wildlife. Philosophical Transactions of the Royal Society - Biological Sciences 364:2027-2045.

United States Fish and Wildlife Service (USFWS). 2001. Roseate tern habitat model. [accessed 2022 Feb 18]. https://ecos.fws.gov/ecp/species/2083.

United States Fish and Wildlife Service (USFWS). 2010. Caribbean roseate tern and North Atlantic roseate tern (*Sterna dougallii dougallii*) 5-year review: summary and evaluation. Boquerón, Puerto Rico, and Concord, New Hampshire: 148 p. https://buzzardsbay.org/wp-content/uploads/2019/ 11/USFWS-2010-roseate-tern-5-year-plan.pdf.

United States Fish and Wildlife Service (USFWS). 2019. Black-capped petrel, *Pterodroma hasitata*. [accessed 2022 Jan 25]. https://ecos.fws.gov/ecp/species/4748.

United States Fish and Wildlife Service (USFWS). 2021a. Endangered and threatened wildlife and plants; designation of critical habitat for rufa red knot (*Calidris canutus rufa*). Federal Register. 37410 p.

United States Fish and Wildlife Service (USFWS). 2021b. Status of the species. [accessed 2022 Feb 18]. https://www.fws.gov/verobeach/StatusoftheSpecies.html.

United States Fish and Wildlife Service (USFWS). 2022a. Wertheim National Wildlife Refuge closes Little Neck Run for nesting bald eagles. [accessed 22 May 2023]. https://www.fws.gov/story/2022-12/refuge-closes-little-neck-run-nesting-bald-eagles.

United States Fish and Wildlife Service (USFWS). 2022b. Threat to birds: collisions. [accessed 2022 July 18]. https://www.fws.gov/library/collections/threats-birds-collisions.

Veit RR, Petersen WR. 1993. Birds of Massachusetts. Massachusetts Audubon Society. [accessed 2022 July 18]. https://archive.org/details/birdsofmassachus0000veit.

Veit RR, White TP, Perkins SA, Curley S. 2016. Abundance and distribution of seabirds off southeastern Massachusetts, 2011-2015. Report No.: OCS Study BOEM 2016-067.

Wang L, Nabi G, Yin L, Wang Y, Li S, Hao Z, Li D. 2021. Birds and plastic pollution: recent advances. Avian Research 121(59):1-9.

Watts BD. 2010. Wind and waterbirds: establishing sustainable mortality limits within the Atlantic flyway. Williamsburg, Virginia: College of William and Mary/Virginia Commonwealth University. Report No.: Technical Report Series CCBTR-10-05.

Winship AJ, Kinlan BP, White TP, Leirness JB, Christensen J. 2018. Modeling at-sea density of marine birds to support Atlantic marine renewable energy planning: final report. Sterling, Virginia: U.S. Department of the Interior Bureau of Ocean Energy Management. Report No.: OCS Study BOEM 2018-010.

Yamashita R, Takada H, Fukuwaka M, Watanuki Y. 2011. Physical and chemical effects of ingested plastic debris on short-tailed shearwaters, *Puffinus tenuirostris*, in the north Pacific Ocean. Marine Pollution Bulletin 62(12):2845-2849.

Zapata MJ, Sullivan SMP, Gray SM. 2019. Artificial lighting at night in estuaries—implications from individuals to ecosystems. Estuaries and Coasts 42:309-330.

K.3.7. Section 3.9 – Coastal Habitat and Fauna

Allan G, Comerford D, Connolly K, McGregor P, Ross AG. 2020. The economic and environmental impacts of UK offshore wind development: The importance of local content. Energy 199:117436.

Allison TD, Diffendorfer JE, Baerwald EF, Beston JA, Drake D, Hale AM, Hein CD, Huso MM, Loss SR, Lovich JE. 2019. Impacts to wildlife of wind energy siting and operation in the United States. Issues in Ecology 21(1):2-18.

Bureau of Ocean Energy Management (BOEM). 2019. National environmental policy act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic Outer Continental Shelf. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2019-036.

Central Pine Barrens Joint Planning & Policy Commission. 2022. Central Pine Barrens overview. Central Pine Barrens Joint Planning & Policy Commission. [accessed 2022 Jun 09]. https://pb.state.ny.us/central-pine-barrens/overview/.

Cook R, Brotherton D, Behler J. 2010. Inventory of amphibians and reptiles at the William Floyd estate, Fire Island National Seashore natural resource report NPS/NCBN/NRTR—2010/380j. 116 pages.

Costello CT, Kenworthy WJ. 2011. Twelve-year mapping and change analysis of eelgrass (*Zostera marina*) areal abundance in Massachusetts (U.S.A.) identifies statewide declines. Estuaries and Coasts 34(2):232-242.

Davis M, Green T, Anderson R. 2005. Understory composition of the Long Island pine barrens. Brookhaven National Laboratory. [accessed 2022 Jun 09]. https://www.bnl.gov/esd/wildlife/files/research/pdf/davis_poster_2005.pdf.

Edinger GJ, Evans DJ, Gebauer S, Howard TG, Olivero AM. 2014. Ecological communities of NYS second edition: A revised and expanded edition of Carol Reschke's ecological communities of NYS. NY NHP, NYS Department of Environmental Conservation, Albany, NY. 173 p.

Farr ER, Johnson MR, Nelson MW, Hare JA, Morrison WE, Lettrich MD, Vogt B, Meaney C, Howson UA, Auster PJ. 2021. An assessment of marine, estuarine, and riverine habitat vulnerability to climate change in the northeast U.S. Plos. One 16(12):e0260654.

Greenman-Pedersen Inc (GPI). 2008. Environmental assessment beach nourishment and maintenance dredging at Smith Point County Park and Cupsogue County Park. Greenman-Pedersen, Inc. 79 p. [accessed 2022 Jun 09]. https://parkplanning.nps.gov/document.cfm?parkID=227&projectID=22546&documentID=24276.

Griffith G. 2010. Level III North American terrestrial ecoregions: United States descriptions. Prepared for the North American Commission for Environmental Cooperation. 1-64.

Grossman D, Faber-Langendoen D, Weakley A, Anderson M, Bourgeron P, Crawford R, Goodin K, Landaal S, Metzler K, Patterson K. 1998. International classification of ecological communities: Terrestrial vegetation of the United States. The Nature Conservancy, Arlington, Virginia. 126 p. [accessed 2022 Jun 09]. https://cmerwebmap.cr.usgs.gov/catalog/item/545d07d5e4b0ba8303f726d9.

Klopfer S, Olivero A, Sneddon L, Lundgren J. 2002. Final report of the NPS vegetation mapping project at Fire Island National Seashore. Blacksburg, VA: Conservation Management Institute, GIS and Remote Sensing Division, College of Natural Resources, Virginia Tech. [accessed 2022 Jun 09]. https://vtechworks.lib.vt.edu/handle/10919/89679.

Lindsey R. 2020. Climate change: atmospheric carbon dioxide. NOAA climate.gov science and information for a climate-smart nation. [accessed 2022 Jun 09]. https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide.

Long Island Sound Coastal Management Program. 1999. Long Island Sound coastal management program your cost, your future. Albany, NY: U.S. Department of Commerce, NOAA, Office of Ocean and Coastal Resource Management. 130 p.

Lovett GM, Tear TH, Evers DC, Findlay SE, Cosby BJ, Dunscomb JK, Driscoll CT, Weathers KC. 2009. Effects of air pollution on ecosystems and biological diversity in the eastern United States. Annals of the NY Academy of Sciences 1162(1):99-135.

Lynch PJ. 2017. A field guide to Long Island Sound: coastal habitats, plant life, fish, seabirds, marine mammals, and other wildlife. September 2017. Yale University Press. 416 p.

National Park Service (NPS). 2020. Integrated coastal climate change vulnerability assessment Fire Island National Seashore Natural resource report NPS/FIIS/NRR—2020/2156. 222 p.

New Jersey Department of Environmental Protection (NJ DEP). 2020. New Jersey scientific report on climate change. 205 pages. https://dep.nj.gov/wp-content/uploads/climatechange/nj-scientific-report-2020.pdf.

New York Natural Heritage Program Significant Natural Communities. 2021. Natural Heritage community occurrences. NYS Department of Environmental Conservation. [accessed 2022 Jun 09]. http://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1241.

New York Natural Heritage Program (NYNHP). 2013. Online conservation guide for *Kinosternon subrubrum*. [accessed 2022 Jun 09]. http://www.acris.nynhp.org/guide.php?id=7514.

New York State Department of Environmental Conservation (NYSDEC). 2008a. Coastal fish & wildlife habitat assessment form – Great South Bay-East. [accessed 2022 Jan 07]. https://dos.ny.gov/system/files/documents/2020/03/great_south_bay_east.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2008b. Coastal fish & wildlife habitat assessment form – Smith Point County Park. [accessed 2022 Jan 07]. https://dos.ny.gov/system/files/documents/2020/03/smith_point_county_park.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2008c. Coastal fish & wildlife habitat assessment form – Moriches Bay. [accessed 2022 Jan 07]. https://dos.ny.gov/system/files/documents/2020/03/moriches_bay.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2008d. Coastal fish & wildlife habitat assessment form – Carmans River. [accessed 2022 Jun 09]. https://dos.ny.gov/system/files/documents/2020/03/carmans_river.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2020. Critical environmental areas in New York. [accessed 2022 Jun 09]. https://www.dec.ny.gov/permits/6184.html.

New York State Department of State (NYSDOS). 2013. Significant coastal fish & wildlife habitat 2.0. metadata. Division of Coastal Resources. [accessed 2022 Jun 09]. https://data.gis.ny.gov/datasets/NYSDOS::significant-coastal-fish-wildlife-habitats-ny/explore.

Nordstrom KF, Jackson NL. 2005. Bay shoreline physical processes (Fire Island National Seashore science synthesis paper). Boston, MA: NPS. Technical Report NPS/NER/NRTR—2005/020.

Nordstrom K, Jackson N, Rafferty P, Raineault N, Grafals-Soto R. 2009. Effects of bulkheads on estuarine shores: an example from Fire Island National Seashore, U.S.A. Journal of Coastal Research Special Issue (56):188-192.

Ricci G, Robadue Jr. DD, Rubinoff P, Casey A, Babson AL. 2020. Integrated coastal climate change vulnerability assessment: Fire Island National Seashore. Natural Resource Report NPS/FIIS/NRR—2020/2156. National Park Service, Fort Collins, Colorado. NPS/FIIS/NRR—2020/2156. 222 p.

Sacatelli R, Lathrop R, Kaplan M. 2020. Impacts of climate change on coastal forests in the northeast U.S. New Brunswick, NJ: Rutgers Climate Institute. Rutgers University. 48 p.

Sohl TL. 2003. Atlantic coastal pine barrens. U.S. Geological Survey. Earth Resources Observation and Science Center Report 092-03.

Sordello R, Ratel O, Flamerie De Lachapelle F, Leger C, Dambry A, Vanpeene S. 2020. Evidence of the impact of noise pollution on biodiversity: a systematic map. Environmental Evidence 9(1):1-27.

South Shore Estuary Reserve (SSER) Council. 2021. Long Island South Shore estuary reserve comprehensive management plan 2021. 130 p. [accessed 2022 Jun 09]. https://dos.ny.gov/news/nys-department-state-releases-draft-2021-long-island-south-shore-estuary-reserve-comprehensive.

State of New York. 1982. NYS coastal management program and final environmental impact statement. Albany, NY: U.S. Department of Commerce National Oceanic and Atmospheric Administration, Office of Coastal Zone Management. 475 p. https://dos.ny.gov/system/files/documents/2023/04/revised-nys-cmp-2023_0.pdf

Stantec Consulting Services Inc. (Stantec). 2022a. Essential fish habitat. Appendix N1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. August 2022.

Stantec Consulting Services Inc. (Stantec). 2022b. Offshore ecological assessment and field survey report - confidential. Appendix L in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Suffolk County Department of Economic Development and Planning. 2016. 2016 Land use polygon. [accessed 2022 Jun 09]. https://opendata.suffolkcountyny.gov/datasets/SuffolkGIS::landuse-2016-polygon/about.

Suffolk County Department of Economic Development and Planning. 2021. Parks polygon. [accessed 2022 Jun 09]. https://opendata.suffolkcountyny.gov/datasets/SuffolkGIS::park-polygon/about.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Tanski J, Bokuniewicz H, Schlenk C. 2001. Impacts of barrier island breaches on selected biological resources of Great South Bay, NY. NY Sea Grant Joint Program of the State University of NY and Cornell University. Final Report NYSGI-01-02. 111 p.

United States Fish and Wildlife Service (USFWS). 1997. Significant habitats and habitat complexes of the NY Bight watershed. Southern New England - NY Bight Coastal Ecosystems Program. Charlestown, Rhode Island. [accessed 2022 Jun 09]. https://www.nrc.gov/docs/ML0719/ML071970390.pdf.

United States Geological Survey (USGS). 2013. Coastal change from Hurricane Sandy and the 2012–13 winter storm season—Fire Island, NY. U.S. Geological Survey Open-File Report 2013-1231. 37 p.

White EE, Ury EA, Bernhardt ES, Yang X. 2021. Climate change driving widespread loss of coastal forested wetlands throughout the North American coastal plain. Ecosystems 1-16.

Wilson R, Wong K, Carter H. 1991. Aspects of circulation and exchange in Great South Bay. 9-22 p. In: Schubel J, Bell T, Carter H (Eds). The Great South Bay Stony Brook, NY: State University of NY Press. Schubel.

K.3.8. Section 3.10 – Finfish, Invertebrates, and Essential Fish Habitat

Aimon C, Simpson SD, Hazelwood RA, Bruintjes R, Urbina MA. 2021. Anthropogenic underwater vibrations are sensed and stressful for the shore crab *Carcinus maenas.* Environmental Pollution 285:117148.

AKRF Inc., AECOM, Popper A. 2012. Essential fish habitat assessment for the Tappan Zee Hudson River Crossing Project, Rockland and Westchester Counties, New York and the Historic Area Remediation Site, New York Bight Apex.

Albert L, Deschamps F, Jolivet A, Olivier F, Chauvaud L, Chauvaud S. 2020. A current synthesis on the effects of electric and magnetic fields emitted by submarine power cables on invertebrates. Marine Environmental Research 159 (2020): 104958.

Almeda R, Hyatt C, Buskey E. 2014. Toxicity of dispersant Corexit 9500A and crude oil to marine microzooplankton. Ecotoxicology and Environmental Safety 106C: 76–85. 10.1016/j.ecoenv.2014.04.028.

Alexander MA, Shin S, Scott JD, Curchitser E, Stock C. 2020. The response of the northwest Atlantic Ocean to climate change. Journal of Climate 33(2):405 428.

Andersson MH, Andersson S, Ahlsén J, Andersson BL, Hammar J, Persson LKG, Pihl J, Sigray P, Wikström A. 2016. A framework for regulating underwater noise during pile driving. A technical Vindval report, ISBN 978-91-620-6775-5. Swedish Environmental Protection Agency, Stockholm, Sweden.

Atlantic Sturgeon Status Review Team (ASSRT). 2007. Status Review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007. 174 pp. Auld AH, Schubel JR. 1978. Effects of suspended sediment on fish eggs and larvae: a laboratory assessment. Estuar. Coast. Mar. Sci. 6:153–164.

Auster P. 1998. A conceptual model of the impacts of fishing gear on the integrity of fish habitats. Conservation Biology 12(6): 1198–1203.

Auster P. 2001. Defining thresholds for precautionary habitat management actions in a fisheries context. North American Journal of Fisheries Management 21:1-9.

Auster P, Langton R. 1999. The effects of fishing on fish habitat. American Fisheries Science Symposium 22: 150-187.

Auster P, Lindholm J. 2005. The ecology of fishes on deep boulder reefs in the western Gulf of Maine. Pages 89-107 in Diving for Science. Proceedings of the American Academy of Underwater Sciences. Connecticut Sea Grant, Groton.

Bachman M, Couture J. 2022. Habitat committee report. Staff presentation to the New England Fishery Management Council. June 30, 2022. Portland, Maine.

Bailey H, Brookes KL, Thompson PM. 2014. Assessing environmental impacts of offshore wind farms: lessons learned and recommendations for the future. Aquatic Biosystems 10:8.

Bay State Wind LLC. 2019. Construction and operations plan, Bay State Offshore Wind Farm. Submitted to Bureau of Ocean Energy Management. Submitted by Bay State Wind LLC. Submitted March 2019, Revised July 2019.

Becker A, Whitfield KA, Cowley PD, Järnegren J, Næsje TJ. 2013. Does boat traffic cause displacement of fish in estuaries? Marine Pollution Bulletin 75(1):168–173.

Bejder L, Samuels A, Whitehead H, Finn H, Allen S. 2009. Impact assessment research: use and misuse of habituation, sensitisation and tolerance in describing wildlife responses to anthropogenic stimuli. Marine Ecology Progress Series 395: 177–185.

Bergström L, Sundqvist F, Bergström U. 2013. Effects of an offshore wind farm on temporal and spatial patterns in the demersal fish community. Marine Ecology Progress Series 485: 199−210.

Bergström L, Kautsky L, Malm T, Rosenberg R, Wahlberg M, Capetillo A, Wilhelmsson D. 2014. Effects of offshore wind farms on marine wildlife – a generalized impact assessment. Environmental Research Letters 9(3):1-12.

Berry W, Rubinstein N, Melzian B, Hill B. 2003. The biological effects of suspended and bedded sediment (SABS) in aquatic systems: a review. Internal U.S. Environmental Protection Agency Report. [accessed 20 August 2022]. https://archive.epa.gov/epa/sites/production/files/2015-10/documents/sediment-appendix1.pdf.

Bethoney N, Stokesbury K. 2019. Implications of extremely high recruitment: crowding and reduced growth within spatial closures. Marine Ecology Progress Series 611:157–165.

Bureau of Ocean Energy Management (BOEM). 2012. Commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf offshore Massachusetts: environmental assessment. OCS EIS/EA BOEM 2012-087. Herndon, Virginia: United States Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs.

Bureau of Ocean Energy Management (BOEM). 2013. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Rhode Island and Massachusetts revised environmental assessment. OCS EIS/EA BOEM 2014-603. Herndon,

Virginia: United States Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs.

Bureau of Ocean Energy Management (BOEM). 2019. Guidelines for providing benthic habitat survey information for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR part 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 9 p.

Cadrin SX, Zemeckis D, Zemeckis R, Dean MJ, Cournane J. 2020. An interdisciplinary review of Atlantic cod (*Gadus morhua*) stock structure in the western north Atlantic Ocean. In: McBride RS, Smedbol RK (Eds). NOAA Tech Memo NMFS-NE-XXX. June 2020.

Carpenter JR, Merckelback L, Callies U, Clark S, Gaslikova L, Baschek B. 2016. Potential impact of offshore wind farms on North Sea stratification. PLoS ONE 11(8): e0160830.

Causon PD, Gill AB. 2018. Linking ecosystem services with epibenthic biodiversity change following installation of offshore wind farms. Environmental Science and Policy 89:340–347.

Cazenave PW, Torres R, Allen JI. 2016. Unstructured grid modelling of offshore wind farm impacts on seasonally stratified shelf seas. Progress in Oceanography 145 (2016): 25-41.

Chen Z, Curchitser E, Chant R, Kang D. 2018. Seasonal variability of the cold pool over the Mid-Atlantic Bight continental shelf. Journal of Geophysical Research: Oceans 123(11):8203-8226.

Chen C, Zhao L, S. Gallager, R. Ji, P. He, C. Davis, R.C. Beardsley, D. Hart, W.C. Gentleman, L. Wang, S. Li, H. Lin, K. Stokesbury, and D. Bethoney. 2021. Impact of larval behaviors on dispersal and connectivity of sea scallop larvae over the northeast U.S. shelf. Progress in Oceanography 195:102604.

Christiansen N, Daewel U, Schrum C. 2022. Tidal mitigation of offshore wind wake effects in coastal seas. Front. Mar. Sci. 9:1-15.

Clucas G, Lou NR, Therkildsen NO, Kovach AI. 2019. Novel signals of adaptive genetic variation in northwestern Atlantic cod revealed by whole-genome sequencing. Evolutionary Applications 12:1971–1987.

CoastalVision, Germano & Associates. 2010. Sediment profile & plan view imaging report: Evaluation of sediment and benthos characteristics along potential cable routes and turbine locations for the proposed Block Island Wind Farm. Report prepared for Deepwater Wind, Providence, RI.

Collette BB, Klein-MacPhee G (Eds.). 2002. Bigelow and Schroeder's fishes of the Gulf of Maine. 3rd Edition. Washington, DC: Smithsonian Institution Press.

Collie J, Hermsen J, Valentine P, and Almeida F. 2005. Effects of fishing on gravel habitats: assessment and recovery of megafauna on Georges Bank. Pp. 325-343 in P.W. Barnes and J.P. Thomas (eds.) Benthic habitats and the effects of fishing. American Fisheries Science Symposium 41, Bethesda, MD.

Collins MR, Smith TIJ, Post WC, Pashuk O. 2000. Habitat utilization and biological characteristics of adult Atlantic sturgeon in two South Carolina rivers. Transactions of the American Fisheries Society 129:982–988.

Collins MR, Smith TIJ. 1997. Distributions of shortnose and Atlantic sturgeons in South Carolina. North American Journal of Fisheries Management 17-995-1000.

Confluence (Confluence Environmental Company). 2023. Revolution Wind Farm and Revolution Wind Export Cable – development and operation. Essential fish habitat assessment. Prepared for BOEM. Washington, D.C.

Cresci A, Perrichon P, Durif CMF, Sørhus E, Johnsen E, Bjelland R, Larsen T, Skiftesvik AB, Browman HI. 2022. Magnetic fields generated by the DC cables of offshore wind farms have no effect on spatial distribution or swimming behavior of lesser sand eel larvae (*Ammodytes marinus*). Marine Environmental Research 176:105609.

CSA Ocean Sciences Inc. 2020. Application for incidental harassment authorization for the non-lethal taking of marine mammals: site characterization surveys lease OCS-A 0486, 0517, 0487, 0500 and associated export cable routes. Submitted to Ørsted. July 2020. 89 p.

CSA Ocean Sciences Inc. and Exponent. 2019. Evaluation of potential EMF effects on fish species of 25 commercial or recreational fishing importance in Southern New England. Sterling, VA: U.S. Dept. of the Interior, Bureau of Ocean Energy Management. Report No. BOEM-2019- 26 049.

Dadswell MJ. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. Fisheries 31:218–229.

Daewel U, Akhtar N, Christiansen N. 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Commun. Earth Environ. 3:292. https://doi.org/10.1038/s43247-022-00625-0.

Dean MJ, Hoffman WS, Zemeckis DR, and Armstrong MP. 2014. Fine-scale diel and gender-based patterns in behaviour of Atlantic cod (*Gadus morhua*) on a spawning ground in the western Gulf of Maine. ICES Journal of Marine Science 71: 1474–1489.

Dean M, DeCelles G, Zemeckis D, and Ames T. 2022. Early life history: spawning to settlement. Chapter 2 in: An interdisciplinary review of Atlantic cod *(Gadus morhua*) stock structure in the western North Atlantic Ocean. McBride RS, Smedbol RK (Eds). U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NE-XXX (in press). 251 p.

Dean M, DeCelles G, Zemeckis D, Ames T. 2020. Early life history. In: An interdisciplinary review of Atlantic cod (*Gadus morhua*) stock structure in the western north Atlantic Ocean. McBride RS, Smedbol RK (Eds). NOAA Tech Memo NMFS-NE-XXX. June 2020.

Dean MJ, Hoffman WS, Armstrong MP. 2012. Disruption of an Atlantic cod spawning aggregation resulting from the opening of a directed gill-net fishery. North American Journal of Fisheries Management 32: 124-134.

Dean M, Hoffman WS, Zemeckis DR, Armstrong MP. 2019. Fine-scale diel and gender-based patterns in behaviour of Atlantic cod (*Gadus morhua*) on a spawning ground in the Western Gulf of Maine. ICES Journal of Marine Science 71(6):1474-1489.

DeCelles GR, Martins D, Zemeckis DR, and Cadrin SX. 2017. Using fishermen's ecological knowledge to map Atlantic cod spawning ground on Georges Bank. ICES Journal of Marine Science 74: 1587–1601.

Deepwater Wind South Fork, LLC. 2019. Appendix H4 of volume II, construction and operations plan South Fork Wind Farm. Submitted to Bureau of Ocean Energy Management, Sterling, VA. Revision 3: February 2019.

Degraer S, Carey DA, Coolen JWP, Hutchison ZL, Kerckhof F, Rumes B, Vanaverbeke J. 2020. Offshore wind farm artificial reefs affect ecosystem structure and functioning. Oceanography 33(4): 48-57.

De Jong K, Forland N, Amorim MCP, Rieucau G, Slabbekoorn H, Sivle LD. 2020. Predicting the effects of anthropogenic noise on fish reproduction. Rev. Fish Biol. Fisheries 30, 245–268. https://doi.org/10.1007/s11160-020-09598-9.

Denes SL, Zeddies DG, Weirathmueller MM. 2021. Turbine foundation and cable installation at South Fork wind farm: underwater acoustic modeling of construction noise. Appendix J1 in Construction and Operations Plan South Fork Wind Farm. Silver Spring, Maryland: JASCO Applied Sciences.

Dorrell RM, Lloyd CJ, Lincoln BJ, Rippeth TP, Taylor JR, Caulfield CP, Sharples J, Pollon JA, Scannel BD, Greaves DM, Hall RA, Simpson JH. 2022. Anthropogenic mixing in seasonally stratified shelf seas by offshore wind farm infrastructure. Front. Mar. Sci. 9, 1–25.

Dunton KJ, Jordaan A, McKown KA, Conover DO, Frisk MG. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus*) within the northwest Atlantic Ocean, determined from five fishery-independent surveys. Fisheries Bulletin 108:450–465.

DWW Rev I, LLC. 2020. Construction and operations plan, Revolution Wind Farm. Prepared by VHB, Providence, RI. Submitted to the Bureau of Ocean Energy Management, Sterling, VA. March 2020.

Edmonds NJ, Firmin CJ, Goldsmith D, Faulkner RC, Wood DT. 2016. A review of crustacean sensitivity to high amplitude underwater noise: data needs for effective risk assessment in relation to UK commercial species. Marine Pollution Bulletin 108(1–2):5–11.

Elliot JB, Smith K, Gallien DR, Khan AA. 2017. Observing cable laying and particle settlement during the construction of the Block Island Wind Farm. Final report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2017-027. 225 pp.

Erickson DL, Kahnle A, Millard MJ, Mora EA, Bryja M, Higgs A, Mohler J, DuFour M, Kenney G, Sweka J, Pikitch EK. 2011. Use of pop-up satellite archival tags to identify oceanic-migratory patterns for

adult Atlantic sturgeon, *Acipenser oxyrinchus* Mitchell, 1815. Journal of Applied Ichthyology 27:356–365.

Espinel-Velasco N, Hoffmann L, Agüera A, Byrne M, Dupont S, Uthicke S, Webster NS, Lamare M. 2018. Effects of ocean acidification on the settlement and metamorphosis of marine invertebrate and fish larvae: a review. Marine Ecology Progress Series 606: 237-257.

Essink K. 1999. Ecological effects of dumping of dredged sediments; options for management. Journal of Coastal Conservation 5:69–80.

Exponent Engineering P.C. 2022. Onshore DC and AC magnetic field assessment. Appendix J2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Farr ER, Johnson MR, Nelson MW, Hare JA, Morrison WE, Lettrich MD, Vogt B, Meaney C, Howson UA, Auster PJ, Borsuk FA. 2021. An assessment of marine, estuarine, and riverine habitat vulnerability to climate change in the Northeast U.S. PLoS ONE 9: 16(12): e0260654.

Fisheries Hydroacoustic Working Group (FHWG). 2008. Agreement in principle for interim criteria for injury to fish from pile driving activities. Technical Policy Meeting June 11, 2008. Vancouver, WA.

Floeter J, van Beusekom JEE, Auch D, Callies U, Carpenter J, Dudeck T, Eberle S. 2017. Pelagic effects of offshore wind farm foundations in the stratified North Sea. Progress in Oceanography 156: 154-173.

Floeter J, Pohlmann T, Harmer A, Mollmann C. 2022. Chasing the offshore wind farm windwake-induced upwelling/downwelling dipole. Frontiers in Marine Science 9:884943.

Gardline. 2021. Sunrise Wind Farm individual boulders within boulder fields (2019, 2020). Geophysical 1B Survey Interpretation Report, Sunrise Wind Farm Project.

Gedamke J, Ferguson M, Harrison J, Hatch L, Henderson L, Porter MB, and Parijs SV. 2016. Predicting anthropogenic noise contributions to U.S. waters. In The effects of noise on aquatic life II (p. 341-347). Springer, New York, NY.

Germano J, Parker J, Charles J. 1994. Monitoring cruise at the Massachusetts Bay disposal site, August 1990. DAMOS Contribution No. 92. U.S. Army Corps of Engineers, New England Division. Waltham, Massachusetts.

Gill AB. 2005. Offshore renewable energy: ecological implications of generating electricity in the coastal zone. Journal of Applied Ecology 42(4):605-615.

Gill AB, Desender M. 2020. Risk to animals from electromagnetic fields emitted by electric cables and marine renewable energy devices. In OES Environmental 2020 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World. Copping AE, Hemery LG (Eds.), Report for Ocean Energy Systems (OES). (pp. 86–103). DOI:10.2172/1633088.

Gill AB, Kimber J. 2005. The potential for cooperative management of elasmobranchs and offshore renewable energy development in UK waters. Journal of the Marine Biological Association of the United Kingdom 85(5):1075-1081.

Greene JK, MG Anderson, Odell J, Steinberg N, editors. 2010. The Northwest Atlantic marine ecoregional assessment: species, habitats and ecosystems. Phase one. The Nature Conservancy, Eastern U.S. Division. Boston, MA.

Guarinello ML, Carey DA. 2020. Multi-modal approach for benthic impact assessments in moraine habitats: a case study at the Block Island Wind Farm. Estuaries and Coasts. Special Issue: Shallow Water Mapping.

Guarinello M, Carey D, Brown Read L. 2017. Year 1 report for 2016 summer post-construction surveys to characterize potential impacts and response of hard bottom habitats to anchor placement at the Block Island Wind Farm. INSPIRE Environmental prepared for Deepwater Wind Block Island LLC. May.

Guida V, Drohan A, Welch H, McHenry J, Johnson D, Kentner V, Brink J, Timmons D, Pessutti J, Fromm S, Estela-Gomez E. 2017. Habitat mapping and assessment of Northeast wind energy areas. Highlands, NJ: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS BOEM 2017-088.

Handegard NO, Tjøstheim D. 2005. When fish meet a trawling vessel: examining the behaviour of gadoids using a free-floating buoy and acoustic split-beam tracking. Canadian Journal of Fisheries and Aquatic Sciences 62(10):2409 2422.

Hare JA, Morrison WE, Nelson MW, Stachura MM, Teeters EJ, Griffis RB, Griswold CA. 2016. A vulnerability assessment of fish and invertebrates to climate change on the Northeast continental shelf. PLoS One 11(2):30.

Harsanyi P, Scott K, Easton BA, de la Cruz Ortiz G, Chapman EN, Piper AR, Rochas CV, Lyndon AR. 2022. The effects of anthropogenic electromagnetic fields (EMF) on the early development of two commercially important crustaceans, European lobster, *Homarus gammarus* (L.) and edible crab, *Cancer pagurus* (L.). J. Mar. Sci. Eng. 10(5):564-581.

Hastings MC, Popper AN. 2005. Effects of sound on fish (Report No. 43A0139). Prepared for California Department of Transportation. 82 p.

Hatfield EMC, Cadrin SX. 2002. Geographic and temporal patterns in size and maturity of the longfin inshore squid (*Loligo pealeii*) off the northeastern United States. Fishery Bulletin 2002: 200-213.

Hawkins AD, Johnson C, Popper AN. 2020. How to set sound exposure criteria for fishes. The Journal of the Acoustical Society of America 147: 1762-1777.

Hawkins AD, Pembroke AE, Popper AN. 2014. Information gaps in understanding the effects of noise on fishes and invertebrates. Reviews in Fish Biology and Fisheries 25(1): 39 64.

Hemery LG. 2020. 2020 State of the science report - chapter 6: changes in benthic and pelagic habitats caused by marine renewable energy devices. 10.2172/1633182.

Hernandez KM, Risch D, Cholewiak DM, Dean MJ, Hatch LT, Hoffman WS, Rice AN, Zemeckis D, Van Parijs SM. 2013. Acoustic monitoring of Atlantic cod (*Gadus morhua*) in Massachusetts Bay: implications for management and conservation. ICES Journal of Marine Science 70: 628-635.

Hirsch ND, DiSalvo LH, Peddicord R. 1978. Effects of dredging and disposal on aquatic organisms. Technical Report DS-78-5. U.S. Army Engineer Waterways Experiment Station. Vicksburg, MS. NTIS No. AD A058 989.

Hutchison Z, Sigray P, Haibo H, Gill AB, King J, Gibson C. 2018. Electromagnetic field (EMF) impacts on elasmobranch (shark, rays, and skates) and American lobster movement and migration from direct current cables. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 3 (2018).

Hutchison ZM, Bartley S, Degraer P, English A, Khan J, Livermore B, King JM. 2020a. Offshore wind energy and benthic habitat changes, lessons from Block Island Wind Farm. Oceanography 33(4):58-69.

Hutchison ZL, Secor DH, Gill AB. 2020b. The interaction between resource species and electromagnetic fields associated with electricity production by offshore wind farms." Oceanography 33(4): 96-107.

Ingram EC, Cerrato RM, Dunton KJ, Frisk MG. 2019. Endangered Atlantic sturgeon in the New York wind energy area: implications of future development in an offshore wind energy site. Scientific Reports 9:1-13.

Inspire Environmental (Inspire). 2018. Ichthyoplankton and zooplankton assessment – jet plow entrainment report. Prepared for CH2M and Deepwater Wind South Fork, LLC. April 2018.

Inspire Environmental (Inspire). 2022a. Benthic resources characterization report – federal waters. Appendix M1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. July 2022.

Inspire Environmental (Inspire). 2022b. Benthic resources characterization report – New York State waters. Appendix M2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. July 2022.

Inspire Environmental (Inspire). 2022c. Benthic habitat mapping to support essential fish habitat consultation. Appendix M3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Inspire Environmental (Inspire). 2022d. Essential fish habitat. Appendix N1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. August 2022.

Jézéquel Y, Jones IT, Bonnel J, Chauvaud L, Atema J, Mooney TA. 2021. Sound detection by the American lobster (*Homarus americanus*). Journal of Experimental Biology 224(6).

Johnson JH, Dropkin DS, Warkentine BE, Rachlin JW, Andrews WD. 1997. Food habits of Atlantic sturgeon off the central New Jersey coast. Transactions of the American Fisheries Society 126(1):166-170.

Johnson TL, van Berkel JJ, Mortensen LO, Bell MA, Tiong I, Hernandez B, Snyder DB, Thomsen F, Svenstrup Petersen O. 2021. Hydrodynamic modeling, particle tracking and agent-based modeling of larvae in the U.S. mid-Atlantic bight. Lakewood, CO: U.S. Department of the Interior, Bureau of Ocean Energy Management. 232 p. Report No. OCS Study BOEM 2021-049.

Jones IT, Peyla JF, Clark H, Song Z, Stanley JA, Mooney TA. 2021. Changes in feeding behavior of longfin squid (*Doryteuthis pealeii*) during laboratory exposure to pile driving noise. Marine Environmental Research 165:105-250.

Jones IT, Stanley JA, Mooney TA. 2020. Impulsive pile driving noise elicits alarm responses in squid (*Doryteuthis pealeii*). Marine Pollution Bulletin 150:110792.

Kastelein RA. 2008. Effects of vibrations on the behaviour of cockles (*bivalve molluscs*). Bioacoustics 17: 74–75.

Kenny AJ, Rees HL. 1994. The effects of marine gravel extraction on the macrobenthos: Early postdredging recolonization. Marine Pollution Bulletin 28: 442–447.

Kerckhof F, Rumes B, Degraer S. 2019. About “mytilisation” and “slimeification”: a decade of succession of the fouling assemblages on wind turbines off the Belgian coast. Pages 73–84 in Dramer S, Brabant R, Rumes B, Vigin L (Eds.). Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Marking a Decade of Monitoring, Research, and Innovation. Tethys. https://tethys.pnnl.gov/publications/environmental-impacts-offshore-wind-farms-belgian-part-north-sea-marking-decade.

Kirchgeorg T, Weinberg I, Hornig M, Baier R, Schmid MJ, Brockmeyer B. 2018. Emissions from corrosion protection systems of offshore wind farms: evaluation of the potential impact on the marine environment. Marine Pollution Bulletin 136: 257-268.

Klimley PA, Wyman MT, Kavet R. 2017. Chinook salmon and green sturgeon migrate through San Francisco estuary despite large distortions in the local magnetic field produced by bridges. PLoS ONE 12 (6): e0169031.

Kraus SD, Leiter S, Stone K, Wikgren B, Mayo C, Hughes P, Kenney RD, Clark CW, Rice AN, Estabrook B, Tielens J. 2016. Northeast large pelagic survey collaborative aerial and acoustic surveys for large whales and sea turtles. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No. OCS Study BOEM 2016-054.

Kuffner A. 2018. Front line of climate change: black sea bass surge off R.I., new article. Providence Journal, July 15, 2018. [accessed 2022 Jun 09].

https://www.providencejournal.com/story/news/ environment/2018/07/15/front-line-of-climate-change-black-sea-bass-surge-off-ri/11512916007/.

Küsel ET, Weirathmueller MJ, Zammit KE, Welch SJ, Limpert KE, Zeddies DG. 2021. Underwater acoustic and exposure modeling. Document 02109, Version 1.0 Draft. Technical report by Bedjer JASCO Applied Sciences for Ocean Wind LLC.

Küsel ET, Weirathmueller MJ, Koessler MW, Zammit KE, Quijano JE, Kanu C, Limpert KE, Clapsaddle ME, Zeddies DG. 2022. Underwater noise and exposure modeling. Appendix I1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. April 2022.

Ladich F and Myrberg AA. 2006. Agonistic behavior and acoustic communication. Communication in Fishes 1(1): 121-148.

LaFrance M, Shumchenia E, King J, Pockalny R, Oakley B, Pratt S, Boothroyd J. 2010. Benthic habitat distribution and subsurface geology selected sites from the Rhode Island special area management study area. Technical Report 4. 99 pp; Kingston, RI: University of Rhode Island.

Lake RG, Hinch SG. 1999. Acute effects of suspended sediment angularity on juvenile coho salmon (*Oncorhynchus kisutch*). Canadian Journal of Fisheries and Aquatic Sciences 56: 862-867.

Langan JA, McManus MC, Zemeckis DR, Collie JS. 2020. Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. Fishery Bulletin 118: 145-156.

Lentz SJ. 2017. Seasonal warming of the Middle Atlantic Bight cold pool. Journal of Geophysical Research Oceans 122(2): 941-954.

Li X, Chi L, Chen X, Ren Y, Lehner S. 2014. SAR observation and numerical modeling of tidal current wakes at the East China Sea offshore wind farm. Journal of Geophysical Research: Oceans 119(8):4958–4971.

Lindeboom HJ, Kouwenhoven HJ, Bergman MJN, Bouma S, Brasseur S, Daan R, Fijn RC, de Haan D, Dirksen S. 2011. Short-term ecological effects of an offshore wind farm in the Dutch coastal zone; a compilation. Environmental Research Letters 6(3):1–13.

Lloret J, Turiel A, Sole J, Berdalet E, Sabates A, Olivares A, Gili J, Vila-Subiros J, Sarda R. 2022. Unraveling the ecological impacts of large-scale offshore wind farms in the Mediterranean Sea. Science of the Total Environment 824.

Loehrke JL. 2014. Movement patterns of Atlantic cod (*Gadus morhua*) spawning groups off New England. MS Thesis, University of Massachusetts, Dartmouth, MA, U.S.A.

Love MS, Nishimoto MM, Clark S, McCrea M, Bull AS. 2017. Assessing potential impacts of energized submarine power cables on crab harvests. Continental Shelf Research 151: 23-29.

Lovell JM, Findlay MM, Moate RM, Nedwell JR, Pegg MA. 2005. The inner ear morphology and hearing abilities of the paddlefish (*Polyodon spathula*) and the lake sturgeon (*Acipenser fulvescens).*

Comparative Biochemistry and Physiology Part A: Molecular Integrative Physiology 142:286–289.

Madsen PT, Wahlberg M, Tougaard J, Lucke K, Tyack P. 2006. Wind turbine underwater noise and marine mammals: Implications of current knowledge and data needs. Marine Ecology Progress Series 309:279-295.

Malek AJ, Collie J, LaFrance M, King J. 2010. Fisheries ecology and benthic habitat in Rhode Island and Block Island sounds. Technical Report #14 of the Ocean Special Area Management Plan. Rhode Island Coastal Resources Management Council, Wakefield, RI.

McBride RS, Tweedie MK, Oliveria K. 2018. Reproduction, first-year growth, and expansion of spawning and nursery grounds of black sea bass (*Centropristis striata*) into a warming Gulf of Maine. Fishery Bulletin 116(3-4): 323-336.

McBride RS, Smedbol RK (Eds). 2022. An interdisciplinary review of Atlantic cod (*Gadus morhua*) stock structure in the western north Atlantic Ocean. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NE-XXX (in press). 251 p.

McCandless CT, Conn P, Cooper P, Cortés E, Laporte SW, Nammack M. 2014. Status review report: Northwest Atlantic dusky shark *(Carcharhinus obscurus).* Report to National Marine Fisheries Service, Office of Protected Resources. October 2014. 72 p.

McManus MC, Hare JA, Richardson DE, Collie JS. 2018. Tracking shifts in Atlantic mackerel (*Scomber scombrus*) larval habitat suitability on the Northeast U.S. Continental Shelf. Fisheries Oceanography 27(1): 49-62.

McQueen K, Meager JJ, Nyqvist D, Skjæraasen JE, Olsen EM, Karlsen O, Kvadsheim PH, Handegard NO, Forland TN, Sivle LD. 2022. Spawning Atlantic cod (*Gadus morhua L.)* exposed to noise from seismic airguns do not abandon their spawning site. ICES Journal of Marine Science 79(10):2697-2708.

Meekan MG, Speed CW, McCauley RD, Fisher R, Birt MJ, Currey-Randall LM, Semmens JM, Newman SJ, Cure K, Stowar M, Vaughan B, Parsons MJG. 2021. A large-scale experiment finds no evidence that a seismic survey impacts a demersal fish fauna. Proceedings of the National Academy of Sciences 118(30).

Metcalfe J, Wright S, Pedersen MWE, Sims D, Righton D. 2015. Movements, migrations and space in the North Sea in relation to offshore wind farms. Abstract from ICES Annual Science Conference 2015, Copenhagen, Denmark. http://orbit.dtu.dk/ws/files/119691328/Publishers_version.pdf).

Methratta ET, Link JS. 2006. Evaluation of quantitative indicators for marine fish communities. Ecological Indicators, Volume 6, Issue 3, August 2006, Pages 575-588.

Meyer M, Fay RR, Popper AN. 2010. Frequency tuning and intensity coding of sound in the auditory periphery of the lake sturgeon, *Acipenser fulvescens*. Journal of Experimental Biology 213:1567–1578.

Mid-Atlantic Fishery Management Council (MAFMC). 2011. Amendment 11 to the Atlantic mackerel, squid, and butterfish fishery management plan. Mid-Atlantic Fishery Management Council. May 2011. https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/53e3ac55e4b0b6a302b8ddff/1407429717006/Consistency_Amendment_SF11_SCOQ11_SMB7.pdf.

Mid-Atlantic Fishery Management Council (MAFMC). 2016. Regional use of the habitat area of particular concern (HAPC) designation. May 2016. noaa_16207_DS1.pdf.

Mid-Atlantic Fisheries Management Council (MAFMC). 2017. Unmanaged forage omnibus amendment: amendment 20 to the summer flounder, scup, and black sea bass fishery management plan, amendment 18 to the mackerel, squid, and butterfish fishery management plan, amendment 19 to the surf clam and ocean quahog fishery management plan, amendment 6 to the bluefish fishery management plan, amendment 5 to the tilefish fishery management plan, amendment 5 to the spiny dogfish fishery management plan, including an environmental assessment, regulatory impact review, and regulatory flexibility act analysis. March 2017.

Miller JH, Potty GR. 2017. Measurements of underwater sound radiated from an offshore wind turbine. The Journal of the Acoustical Society of America 142(4):2699.

Minerals Management Service (MMS). 2007. Programmatic environmental impact statement for alternative energy development and production and alternate use of facilities on the outer continental shelf – final environmental impact statement. Herndon, VA: U.S. Dept. of the Interior, Minerals Management Service. Report No. OCS EIS/EA MMS 2007-046.

Minerals Management Service (MMS). 2009. Cape Wind Farm Energy Project final environmental impact statement. Herndon, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Publication No. 2008-040.

Mooney TA, Andersson MH, Stanley J. 2020. Acoustic impacts of offshore wind energy on fishery resources. An evolving source and varied effects across a wind farm's lifetime. Oceanography 33:82–95.

Mooney TA, Hanlon RT, Christensen-Dalsgaard J, Madsen PT, Ketten DR, Nachtigall PE. 2010. Sound detection by the longfin squid (*Loligo pealeii*) studied with auditory evoked potentials: sensitivity to low-frequency particle motion and not pressure. Journal of Experimental Biology 213(21): 3748-3759.

Moser M, Bain M, Collins M , Haley N, Kynard B, O'Herron II J, Rogers G, Squiers T. 2000. A protocol for use of shortnose and Atlantic sturgeons. U.S. Department of Commerce National Oceanic and Atmospheric Administration National Marine Fisheries Service NOAA Technical Memorandum NMFS-OPR-18.

Moser ML, Ross SW. 1995. Habitat use and movements of shortnose and Atlantic sturgeons in the lower Cape Fear River, North Carolina. Transactions of the American Fisheries Society 24:225–234.

Myrberg AA and Lugli M. 2006. Reproductive behavior and acoustical interactions. In: Ladich F, Collin SP, Moller P, Kapoor BG (eds) Communication in Fishes. Enfield, NH: Science Publishers, pp. 147–174.

Munroe DM, Haidvogel D, Caracappa JC, Klinck JM, Powell EN, Hofmann EE, Shank BV, Hart DR. 2018. Modeling larval dispersal and connectivity for Atlantic sea scallop (*Placopecten magellanicus*) in the Middle Atlantic Bight. Fisheries Research 208:7–15.

National Marine Fisheries Service (NMFS). 2019. Atlantic sturgeon. https://www.fisheries.noaa.gov/species/atlantic-sturgeon. Accessed September 2019.

National Marine Fisheries Service (NMFS). 2017. 50 CFR Part 226 Endangered and threatened species; designation of critical habitat for the endangered New York Bight, Chesapeake Bay, Carolina and South Atlantic distinct population segments of Atlantic Sturgeon and the threatened Gulf of Maine distinct population segment of Atlantic sturgeon. [Docket No. 150818735–7452–02] RIN 0648–BF28.

National Marine Fisheries Service (NMFS). 2020. Essential Fish (EFH) Habitat Mapper. Accessed June 2020. https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper.

National Marine Fisheries Service (NMFS). 2021. Endangered Species Act section 7 consultation biological opinion on the: (a) authorization of the American lobster, Atlantic bluefish, Atlantic deep-sea red crab, mackerel/squid/butterfish, monkfish, northeast multispecies, northeast skate complex, spiny dogfish, summer flounder/scup/black sea bass, and Jonah crab fisheries and (b) implementation of the New England Fishery Management Council's omnibus essential fish habitat amendment 2, GARFO-2017-00031. May 27, 2021. 582 p.

National Marine Fisheries Science (NMFS). 2022. New York bight distinct population segment of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus).* 5-year review: Summary and evaluation. National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office Gloucester, Massachusetts. 34 p.

National Oceanic and Atmospheric Administration (NOAA). 2019. U.S. national bycatch report first edition update 3. [accessed: 2022 Jul 01]. https://media.fisheries.noaa.gov/dam-migration/nbr_update_3.pdf.

National Oceanic and Atmospheric Administration (NOAA). 2022a. Habitat conservation. Essential fish habitat. [accessed 2022 Jun 09]. https://www.fisheries.noaa.gov/national/habitat-conservation/essential-fish-habitat.

National Oceanic and Atmospheric Administration (NOAA). 2022b. New England/Mid-Atlantic. [accessed 2022 Jun 09]. https://www.fisheries.noaa.gov/region/new-england-mid-atlantic.

National Oceanic and Atmospheric Administration (NOAA). 2022c. 2022 state of the ecosystem New England. [accessed 2022 Jul 01]. https://apps-nefsc.fisheries.noaa.gov/rcb/publications/soe/SOE-NEFMC_2022-Final.pdf.

National Research Council. 2002. Effects of trawling and dredging on seafloor habitat. Washington, DC: The National Academies Press. https://doi.org/10.17226/10323.

Neo Y, Ufkes E, Kastelein R, Winter H, Cate C, Slabbekoorn H. Impulsive sounds change European seabass swimming patterns: influence of pulse repetition interval. Marine Pollution Bulletin Volume 97, Issues 1–2, 15 August 2015, Pages 111-117.

New England Fishery Management Council (NEFMC). 2017. Omnibus essential fish habitat amendment 2 volume 2: EFH and HAPC designation alternatives and environmental impacts. [accessed 2021 Jun 01]. https://www.habitat.noaa.gov/protection/efh/efhmapper/oa2_efh_hapc.pdf.

New England Fishery Management Council (NEFMC). 2022. Habitat management considerations for the northern edge of Georges Bank. https://s3.us-east-1.amazonaws.com/nefmc.org/6.-220120-Northern-Edge-Habitat-Management-Considerations.pdf.

New York Department of Environmental Conservation (NYSDEC). 1974. DEC tidal wetland areas (dfw_tidal_wetlands). [accessed 2022 Jun 09]. http://opdgig.dos.ny.gov/geoportal/catalog/search/resource/detailsnoheader.page?uuid={E8B21766F7F6-49B0-8346-58E71A8B3DF8}.

New York Department of Environmental Conservation (NYSDEC). 2008. Coastal fish & wildlife habitat assessment form – Carmans River. [accessed 2022 Jun 09]. https://dos.ny.gov/system/files/documents/2020/03/carmans_river.pdf.

New York State Department of State (NYSDOS). 2020. Long Island south shore benthic habitat 2018 (LISS_Biotic_2018_Contractor_Final). [accessed 2022 Jun 09]. http://opdgig.dos.ny.gov/#/search/SAV.

Newcombe CP, Macdonald DD. 1991. Effects of suspended sediments on aquatic ecosystems. North American Journal of Fisheries Management 11:72–82.

Nilsson HC, Rosenberg R. 2003. Effects on marine sedimentary habitats of experimental trawling analyzed by sediment profile imagery. Journal of Experimental Marine Biology and Ecology 285–286:453–463.

Normandeau Associates Inc. (Normandeau), Exponent Inc., Tricas T, Gill A. 2011. Effects of EMFs from undersea power cables on elasmobranch and other marine species. Camarillo, CA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region. OCS Study BOEMRE 2011-09.

Normandeau Associates, Inc (Normandeau). 2012. Effects of noise on fish, fisheries, and invertebrates in the U.S. Atlantic and Arctic from energy industry sound-generating activities. A literature synthesis for the U.S. Dept. of the Interior, Bureau of Ocean Energy Management. Contract # M11PC00031, 1-361 pp. [accessed 2022 Jun 09]. http://www.data.boem.gov/homepg/data_center/other/espis/espismaster.asp?appid=1.

Novak A, Carlson A, Wheeler C, wippelhauser G, Sulikowski J. 2017. Critical foraging habitat of Atlantic sturgeon based on feeding habits, prey distribution, and movement patterns in the Saco River Estuary, Maine. Transactions of the American Fisheries Society 146(2):308–317.

Nye J, Link J, Hare J, Overholtz W. 2009. Changing spatial distribution of fish stocks in relation to climate and population size on the northeast United States continental shelf. Marine Ecology Progress Series 393:111-129. 10.3354/meps08220.

Ocean Wind, LLC (Ocean Wind). 2021. Construction and operations plan. Ocean Wind Offshore Wind Farm. Volumes I–III. March. [accessed 2022 Jun 01]. https://www.boem.gov/ocean-wind-construction-and-operations-plan/.

Orr T, Wood S, Drunsic M, Perkins G. 2016. Development of guidance for lighting of offshore wind turbines beyond 12 nautical miles. Sterling, VA: U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2: 138.

Orth RJ, Lefcheck JS, Wilcox DJ. 2017. Boat propeller scarring of seagrass beds in lower Chesapeake Bay, U.S.A: patterns, causes, recovery, and management. Estuaries and Coasts 40(6):1666–1676.

Packard A, Karlsen HE, Sand O. 1990. Low frequency hearing in cephalopods. Journal of Comparative Physiology A. 166: 501–505.

Pangerc T, Robinson S, Theobald P, Galley L. 2016. Underwater sound measurement data during diamond wire cutting: first description of radiated noise. In Proceedings of the Fourth International Conference on the Effects of Noise on Aquatic Life. July 10–16. Dublin, Ireland. pma.v27.i1.040012_1.online.pdf (silverchair-cdn.com).

Partridge GJ, Michael RJ. 2010. Direct and indirect effects of simulated calcareous dredge material on eggs and larvae of pink snapper *Pagrus auratus*. J. Fish Biol. 77:227–240.

Pederson J, Bullock R, Carlton JT, Dijkstra J, Dobroski N, Dyrynda P, Fishers R, Harris L, Hobbs N, Lambert G, Lazo-Wasem E, Mathieson A, Miglietta M, Smith J, Smith III J, Tyrrell M. 2005. Marine invaders in the northeast: rapid assessment survey of non-native and naïve marine species of floating dock communities. Publication No. 05-03. Cambridge: Massachusetts Institute of Technology, Sea Grand College Program, 40 pp.

Piet GJ, Tamis JE, van der Wal JT, Jongbloed RH. 2021. Cumulative impacts of wind farms on the North Sea ecosystem. Report C081/21. Wageningen University and Research Center.

Pinsky ML, Worm B, Fogarty MJ, Sarmiento JL, Levin SA. 2013. Marine taxa track local climate velocities. Science 341(6151):1239-42.

Plante J. 2022. Council approves HAPC for southern New England; previews northeast regional habitat assessment data explorer. Press release. New England Fishery Management Council. [2022 Jul 18; accessed 11 Nov 2023]. https://www.nefmc.org/news.

Popper AN, Salmon M, and Horch KW. 2001. Acoustic detection and communication by decapod crustaceans. Journal of Comparative Physiology 187:83–89.

Popper AN, Hastings MC. 2009. The effects of anthropogenic sources of sound on fishes. Journal of Fish Biology 75:455–489.

Popper AN, Hawkins A. 2018. The importance of particle motion to fishes and invertebrates. Journal of the Acoustical Society of America 143:470.

Popper AN, Hawkins AD. 2019. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. Journal of Fish Biology 94(5): 692-713.

Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol S, Carlson TJ, Coombs S, Ellison WT, Gentry RL, Halvorsen MB, Løkkeborg S, Rogers PH, Southall BL, Zeddies DG, Tavolga WN. 2014. Sound exposure guidelines for fishes and sea turtles. Technical report prepared by ANSI Accredited Standards Committee S3/SC1 and registered with ANSI. ASA S3/SC1.4 TR-2014.

Popper AN, Salmon M, Horch KW. 2001. Acoustic detection and communication by decapod crustaceans. Journal of Comparative Physiology 187:83–89.

Raghukumar K, Chartrand C, Chang G, Cheung L, and Roberts J. 2022. Effect of floating offshore wind turbines on atmospheric circulation in California. Frontiers in Energy Research 10:863995.

Raoux A, Tecchio S, Pezy JP, Lassalle G, Degraer S, Wilhelmsson D, Cachera M, Ernande M, Le Guen C, Haraldsson M, Grangeré K. 2017. Benthic and fish aggregation inside an offshore wind farm: which effects on the trophic web functioning? Ecological Indicators 72:33-46.

Rheuban JE, Kavanaugh MT, Doney SC. 2017. Implications of future northwest Atlantic bottom temperatures on the American Lobster (*Homarus americanus*) fishery. Journal of Geophysical Research: Oceans 122: 9387–9398.

Richardson WJ, Greene CR, Malme CI, Thomson DH. 1995. Marine mammals and noise. San Diego, California: Academic Press.

Rico-Martinez R, Snell TW, Shearer TL. 2013. Synergistic toxicity of Macondo crude oil and dispersant Corexit 9500A to the *Brachionus plicatilis* species complex (*Rotifera*). Environmental Pollution 173:5–10.

Roarty H, Glenn S, Brodie JF, Handel E, Nazzaro L, Smith M, Brown WS, Boicourt WC, Updyke T, and Atkinson L. 2020. Annual and seasonal surface circulation over the Mid-Atlantic Bight continental shelf derived from a decade of high frequency radar observations. Journal of Geophysical Research: Oceans 125(11): e2020JC016368. https://doi.org/10.1029/2020JC016368.

Roberts L, Cheesman S, Breithaupt T, Elliott M. 2015. Sensitivity of the mussel *Mytilus edulis* to substrate-borne vibration in relation to anthropogenically generated noise. Marine Ecology Progress Series 538: 185-195.

Rosenberg R, Nilsson HC, Gremare A, Amoroux JM. 2003. Effects of demersal trawling on marine sedimentary habitats analyzed by sediment profile imagery. Journal of Experimental Marine Biology and Ecology 285–286:465–477.

Rowe S, Hutchings JA. 2004. The function of sound production by Atlantic cod as inferred from patterns of variation in drumming muscle mass. Canadian Journal of Zoology 82: 1391–1398.

Rowe S, Hutchings JA. 2006. Sound production by Atlantic cod during spawning. Transactions of the American Fisheries Society 135: 529–538.

Saba VS, Griffies MS, Anderson WG, Winton M, Alexander MA, Delworth TL, Zhang R. 2016. Enhanced warming of the Northwest Atlantic Ocean under climate change. Journal of Geophysical Research-Oceans 121(1): 118 132.

Sarà G, Dean JM, D'Amato D, Buscaino G, Oliveri A, Genovese S, Ferro S, Buffa G, Lo Martire M, Mazzola S. 2007. Effect of boat noise on the behaviour of bluefin tuna *Thunnus thynnus* in the Mediterranean Sea. Marine Ecology Progress Series 331: 243–253.

Schultze LKP, Merckelbach LM, Horstmann J, Raasch S, Carpenter Jr .2020. Increased mixing and turbulence in the wake of offshore wind farm foundations. Journal of Geophysical Research: Oceans 125(8): e2019JC015858.

Scotti J, Stent J, Gerbino K. 2010. Final report: New York commercial fisherman ocean use mapping. Prepared for Cornell Cooperative Extension Marine Program. [accessed 2022 May 6]. https://dos.ny.gov/system/files/documents/2020/08/ny_commercial_fisherman_ocean_use_mapping.pdf.

Siceloff L, Howell H. 2013. Fine-scale temporal and spatial distributions of Atlantic cod (*Gadus morhua*) on a western Gulf of Maine spawning ground. Fisheries Research 141: 31-43.

Siddagangaiah S., Chen CF, Hu WCM, Pieretti N. 2022. Impact of pile-driving and offshore windfarm operational noise on fish chorusing. Remote Sensing in Ecology and Conservation, 8: 119-134. https://doi.org/10.1002/rse2.231.

Sigray P, Linné M, Andersson MH, Nöjd A, Persson LKG, Gill AB, Thomsen F. 2022. Particle motion observed during offshore wind turbine piling operation. Marine Pollution Bulletin 180.10.1016/j.marpolbul.2022.113734.

Sinclair M. 1988. Marine populations: an essay on population regulation and speciation. University of Washington Press, Seattle, WA.

Slabbekoorn H, Dalen J, Haan D, Winter HV, Radford C, Ainslie MA, Heaney KD, Kooten T, Thomas L, Harwood J. 2019. Population-level consequences of seismic surveys on fishes: an interdisciplinary challenge. Fish and Fisheries 20:653-685.

Slavik K, Lemmen C, Zhang W, Kerimoglu O, Klingbeil K, Wirtz KW. 2018. The large-scale impact of offshore wind farm structures on pelagic primary productivity in the southern North Sea. Hydrobiologia 845(1):35-53.

Smith TIJ. 1985. The fishery, biology, and management of Atlantic sturgeon, *Acipenser oxyrhynchus*, in North America. Environ. Biol. Fishes 14:61–72.

Smith TIJ, Clugston JP. 1997. Status and management of Atlantic sturgeon, *Acipenser oxyrinchus*, in North America. Environmental Biology of Fishes. 48:335-346.

Snyder DB, Bailey WH, Palmquist K, Cotts BRT, Olsen KR. 2019. Evaluation of potential EMF effects on fish species of commercial or recreational fishing importance in Southern New England. Sterling, VA: U.S. Dept. of the Interior, Bureau of Ocean Energy Management. Report No. OCS Study BOEM 2019-049.

Solan M, Hauton C, Godbold JA, Wood CL, Leighton TG, White P. 2016. Anthropogenic sources of underwater sound can modify how sediment-dwelling invertebrates mediate ecosystem properties. Scientific Reports 6: 1–9. Nature Publishing Group.

Solé M, Sigray P, Lenoir M, Van Der Schaar V, Lalander E, André M. 2017. Offshore exposure experiments on cuttlefish indicate received sound pressure and particle motion levels associated with acoustic trauma. Scientific Reports 7:45899.

Solé M, De Vreese S, Fortuño J, Schaar M, Sánchez A, André M. 2022. Commercial cuttlefish exposed to noise from offshore windmill construction show short-range acoustic trauma. Environmental Pollution.

Stanley JA, Van Parijs SM, and Hatch LT. 2017. Underwater sound from vessel traffic reduces the effective communication range in Atlantic cod and haddock. Scientific Reports 7: 14633.

Stanley JA, Calger PE, Phelan B, Shelledy K, Mooney TA, Van Parijs SM. 2020. Ontogenetic variation in the auditory sensitivity of black sea bass (*Centropristis striata*) and the implications of anthropogenic sound on behavior and communication. Journal of Experimental Biology 223(13): jeb219683. 10.1242/jeb.219683.

Stanley JA, Calger PE, Phelan B, Shelledy K, Mooney TA, Van Parijs SM. 2020. Ontogenetic variation in the auditory sensitivity of black sea bass (*Centropristis striata*) and the implications of anthropogenic sound on behavior and communication. Journal of Experimental Biology 223, jeb219683. 10.1242/jeb.219683.

Stantec Consulting Services Inc. (Stantec). 2020. SFWF – Montauk O&M facility in-water work. Assessment of potential impacts to natural resources from in-water work. Prepared for Deepwater Wind South Fork, LLC.

Stein AB, Friedland KD, Sutherland M. 2004a. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the northeast United States. North American Journal of Fisheries Management. 24:171-183.

Stein AB, Friedland KD, Sutherland M. 2004b. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. Transactions of the American Fisheries Society. 133:527-537.

Stevenson D, Chiarella L, Stephan D, Reid R, Willheim K, McCarthy J, Pentony M. 2004. Characterization of the fishing practices and marine benthic ecosystems of the northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential fish habitat. NOAA Technical Memorandum NMFS-NE-181. 194 pp.

Stokesbury KDE. 2012. Stock definition and recruitment: implications for the U.S. sea scallop (*Placopecten magellanicus*) fishery from 2003 to 2011. Reviews in Fisheries Science 20(3): 154-164.

Stokesbury KDE. 2014. Final report: SMAST video survey of western portion of the offshore windfarm area. School for Marine Science and Technology, Dartmouth. [accessed 2022 May 6]. http://www.repstraus.com/wp-content/uploads/2015/03/SMAST-drop-cam-survey-1999-2014-Stokesbury.pdf.

Sumaila UR, Palacios-Abrantes J, Cheung W. 2020. Climate change, shifting threat points, and the management of transboundary fish stocks. Ecology and Society 25(4): Article 40.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Tallack S. 2009. Proceedings from a workshop to identify future research priorities for cod tagging in the Gulf of Maine. Northeast Fisheries Science Center Reference Document 09-09.

Tallack SML, McKenzie J, Parsons B, Seit AC, Kopf RK, Mesa M, Phelps Q. 2011. Stock identification applications of conventional tagging data for Atlantic cod in the Gulf of Maine proceedings from the 2nd international symposium on advances in fish tagging and marking techniques, 2011 American Fisheries Society Symposium 76: 1-15.

Tamsett A, Heinonen KB, Auster PJ. 2010. Dynamics of hard substratum communities inside and outside of a fisheries habitat closed area in Stellwagen Bank National Marine Sanctuary (Gulf of Maine, NW Atlantic). DU.S. Department of Commerce, NOAA. [accessed 2023 Nov 11]. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/science/conservation/pdfs/tamsett.pdf.

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: knowledge gaps, recommendations and future directions. Renewable and Sustainable Energy Reviews, Elsevier, 2018 (96):380–391.

Thomsen F, Gill A, Kosecka M, Andersson M, Andre M, Degraer S, Folegot T, Gabriel J, Judd A, Neumann T, Norro A, Risch D, Sigray P, Wood D, Wilson B. 2015. MaRVEN – environmental impacts of noise, vibrations and electromagnetic emissions from marine renewable energy. RTD-KI-NA-27-738-EN-N. Final study report prepared for European Commission, Directorate General for Research and Innovation.

Tougaard J, Henriksen OD, Miller LA. 2009. Underwater noise from three types of offshore wind turbines: estimation of impact zones for harbor porpoises and harbor seals. Journal of the Acoustical Society of America 125(6):3766-3773.

Tougaard J, Hermannsen L, Madsen PT. 2020. How loud is the underwater noise from operating offshore wind turbines? The Journal of the Acoustical Society of America 148(5): 2885-2893.

TRC. 2023. Ichthyoplankton entrainment assessment. Appendix N2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

United States Army Corps of Engineers (USACE). 2015. New York and New Jersey Harbor Deepening Project. Dredge Plume Dynamics in New York/New Jersey Harbor. Summary of Suspended Sediment Plume Surveys Performed During Harbor Deepening. April 2015. New York.

United States Environmental Protection Agency (USEPA). 2006. Regional benefits analysis for the final section 316(b) phase III existing facilities rule. [accessed 2023 Nov 21]. https://www.epa.gov/sites/default/files/2015-04/documents/cooling-water_phase-3_regional-benefits_2006.pdf.

United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Science (NMFS). 2018. Recovery plan for the Gulf of Maine distinct population segment of Atlantic salmon (*Salmo salar*). 74 p. https://ecos.fws.gov/docs/recovery_plan/FINAL%20RECOVERY%20PLAN.pdf.

United States Geological Survey (USGS). 2014. ECSTDB2014.SHP: U.S. Geological Survey east coast sediment texture database (2014): open-file report 2005-1001. U.S. Geological Survey, Coastal and Marine Geology Program, Woods Hole Coastal and Marine Science Center, Woods Hole, MA.

Vabø R, Olsen K, Huse I. 2002. The effect of vessel avoidance of wintering Norwegian spring spawning herring. Fisheries Research 58: 59–77.

van Berkel J, Burchard H, Christensen A, Mortensen LO, Petersen OS, Thomsen F. 2020. The effects of offshore wind farms on hydrodynamics and implications for fishes. Oceanography 33(4): 108-117.

Vanhellemont Q, Ruddick K. 2014. Turbid wakes associated with offshore wind turbines observed with Landsat 8. Remote Sensing of Environment 145:105–115.

Van Hoeck RV, Rowell TJ, Dean MJ, Rice AN, Van Parijs SM. 2023. Comparing Atlantic cod temporal spawning dynamics across a biographic boundary: insight from passive acoustic monitoring. Marine and Coastal Fisheries 15(2).

Walsh HJ, Richardson DE, Marancik KE, Hare JA. 2015. Long-term changes in the distributions of larval and adult fish in the northeast U.S. shelf ecosystem. PloS One 10(9): e0137382.

Weilgart LS. 2007. The impacts of anthropogenic ocean noise on cetaceans and implications for management. Canadian Journal of Zoology 85(11):1091-1116.

Weilgart L. 2018. The impact of ocean noise pollution on fish and invertebrates. Report by OceanCare. Dalhousie University. https://tethys.pnnl.gov/sites/default/files/publications/ Weilgart_2018.pdf.

Wilber DH, Clarke DG, Gallo J, Alcoba CJ, Dilorenzo AM, Zappala SE. 2013. Identification of winter flounder (*Pseudopleuronectes americanus*) estuarine spawning habitat and factors influencing egg and larval distributions. Estuaries and Coasts 36:1304–1318.

Wise JP. 1963. Cod groups in the New England area. Fishery Bulletin 63: 189-203.

Woods Hole Group. 2022. Sediment transport modeling report. Appendix H in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Zemeckis DR, Dean MJ, Cadrin SX. 2014. Spawning dynamics and associated management implications for Atlantic cod. North American Journal of Fisheries Management 34: 424–442.

Zemeckis DR, Dean MJ, DeAngelis AI, Van Parijs SM, Hoffman WS, Baumgartner MF, Hatch LT, Cadrin SX, McGuire CH. 2019. Identifying the distribution of Atlantic cod spawning using multiple fixed and glider-mounted acoustic technologies. ICES Journal of Marine Science 76(6): 1610–1625.

Zhang X, Haidvogel D, Monroe D, Powell E, Klinck J, Mann R, and Castruccio F. 2015. Modeling larval connectivity of the Atlantic surfclams within the middle Atlantic Bight: model development, larval dispersal and metapopulation connectivity. Estuarine, Coastal and Shelf Science 153:38–53.

K.3.9. Section 3.11 – Marine Mammals

Albouy C, Delattre V, Donati G, Frölicher TL, Albouy-Boyer S, Rufino M, Pellissier L, Mouillot D, Leprieur F. 2020. Global vulnerability of marine mammals to global warming. Scientific Reports 10. 10.1038/s41598-019-57280-3.

Arnould JPY, Monk J, Ierodiaconou D, Hindell MA, Semmens J, Hoskins AJ, Costa DP, Abernathy K, Marshall GJ. 2015. Use of anthropogenic sea floor structures by Australian fur seals: potential positive ecological impacts of marine industrial development? PloS ONE 10(7):e0130581.

Aschettino JM, Engelhaupt DT, Engelhaupt AG, DiMatteo A, Pusser T, Richlen MF, Bell JT. 2020. Satellite telemetry reveals spatial overlap between vessel high-traffic areas and humpback whales (*Megaptera novaeangliae*) near the mouth of the Chesapeake Bay. Frontiers in Marine Science 7(121). 10.3389/fmars.2020.00121.

Atlantic Marine Conservation Society. 2016. Harbor and gray seal surveys. Atlantic Marine Conservation Society. [accessed 2022 Jun 09]. http://www.amseas.org/harbor-gray-seal-surveys.

Bailey H, Brookes KL, Thompson PM. 2014. Assessing environmental impacts of offshore wind farms: lessons learned and recommendations for the future. Aquatic Biosystems 10(1):1-13.

Baird RW. 2001. Status of harbour seals*, Phoca vitulina*, in Canada. Canadian Field-Naturalist 115(4):663-675.

Balcomb, KC, and Claridge, DF. 2001. A mass stranding of cetaceans caused by naval sonar in the Bahamas. Bahamas J. Sci. 8:1–12.

Bald J, Hernández C, Uriarte A, Alonso D, Ruiz P, Ortega N, Enciso YT, Marina D. 2015. Acoustic characterization of submarine cable installation in the Biscay marine energy platform (bimep). In: Bilbao Marine Energy Week; Bilbao (Spain).

Barco S, McLellan W, Allen J, Asmutis R, Mallon-Day R, Meagher E, Pabst DA, Robbins J, Seton R, Swingle WM. 2002. Population identity of humpback whales (*Megaptera novaeangliae*) in the waters of the U.S. mid-Atlantic states. Journal of Cetacean Research and Management 4(2):135-141.

Baulch S, Perry C. 2014. Evaluating the impacts of marine debris on cetaceans. Marine Pollution Bulletin 80(1–2):210-221.

Benhemma-Le Gall A, Graham I, Merchant N, Thompson P. 2021. Broad-scale responses of harbor porpoises to pile-driving and vessel activities during offshore windfarm construction. Frontiers in Marine Science 8:664724. 10.3389/fmars.2021.664724.

Bejarano AC, Michel J, Rowe J, Li Z, French McCay D, McStay L, Etkin DS. 2013. Environmental Risks, fate and effects of chemicals associated with wind turbines on the Atlantic Outer Continental Shelf. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Herndon, VA. OCS Study BOEM 2013-213.

Benjamins S, Harnois V, Smith HCM, Johanning L, Greenhill L, Carter C, Wilson B. 2014. Understanding the potential for marine megafauna entanglement risk from marine renewable energy developments. Scottish Natural Heritage. 95 p. Report No.: Commissioned Report No. 791.

Bergström L, Kautsky L, Malm T, Rosenberg R, Wahlberg M, Åstrand CN, Wilhelmsson D. 2014. Effects of offshore wind farms on marine wildlife—a generalized impact assessment. Environmental Research Letters 9:1-12. 10.1088/1748-9326/9/3/034012.

Blackwell SB, Nations CS, McDonald TL, Greene CR, Thode AM, Guerra M, Macrander AM. 2013. Effects of airgun sounds on bowhead whale calling rates in the Alaskan Beaufort Sea. Marine Mammal Science. 29(4):E342-E365. doi:10.1111/mms.12001.

Blackwell SB, Nations CS, McDonald TL, Thode AM, Mathias D, Kim KH, Greene CR, Jr., Macrander AM. 2015. Effects of airgun sounds on bowhead whale calling rates: evidence for two behavioral thresholds. PLoS One. 10(6):e0125720. 10.1371/journal.pone.0125720.

Boulva J. 1973. The harbour seal, *Phoca vitulina concolor*, in eastern Canada [Ph.D. diss.]. Dalhousie University. [accessed 2022 Jun 22]. https://dalspace.library.dal.ca/xmlui/bitstream/handle/10222/54903/NK18567Redacted.pdf?sequence=4&isAllowed=y.

Brandt MJ, Diederichs A, Betke K, Nehls G. 2011. Responses of harbour porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. Marine Ecology Progress Series. 421:205-216.

Brandt MJ, Dragon AC, Diederichs A, Schubert A, Kosarev V, Nehls G, Wahl V, Michalik A, Braasch A, Hinz C. 2016. Effects of offshore pile driving on harbour porpoise abundance in the German Bight. 262 p.

Branstetter BK, Bowman VF, Houser DS, Tormey M, Banks P, Finneran JJ, Jenkins K. 2018. Effects of vibratory pile driver noise on echolocation and vigilance in bottlenose dolphins (*Tursiops truncatus*). Journal of the Acoustical Society of America. 143(1):429. doi:10.1121/1.5021555.

Brown DM, Robbins J, Sieswerda PL, Schoelkopf R, Parsons ECM. 2018. Humpback whale (*Megaptera novaeangliae*) sightings in the New York-New Jersey Harbor estuary. Marine Mammal Science 34(1):250-257.

Brown SG. 1986. Twentieth-century records of right whales (*Eubalaena glacialis*) in the northeast Atlantic Ocean. Reports of the International Whaling Commission (Special Issue 10):121-127.

Bureau of Ocean Energy Management (BOEM). 2013. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Rhode Island and Massachusetts. Revised environmental assessment. Herndon, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 417 p. Report No. OCS EIA/EA BOEM 2013-1131.

Bureau of Ocean Energy Management (BOEM). 2019. Guidelines for providing information on fisheries for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR Part 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 14 p.

Bureau of Ocean Energy Management (BOEM). 2021a. Vineyard Wind 1 Offshore Wind Energy Project final environmental impact statement, volume 1. OCS EIS/EA BOEM 2021-0012.

Bureau of Ocean Energy Management (BOEM). 2021b. South Fork Wind Farm and South Fork Export Cable Project final environmental impact statement. OCS EIS/EA BOEM 2020-057.

Brandt MJ, Diederichs A, Betke K, Nehls G. 2011. Responses of harbour porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. Marine Ecology Progress Series 421(2011):205–216.

Brandt MJ, Dragon A, Diederichs A, Schubert A, Kosarev V, Nehls G, Wahl V, Michalik A, Braasch A, Hinz C, Ketzer C, Todeskino D, Gauger M, Laczny M, Piper W. 2016. Effects of offshore pile driving on harbour porpoise abundance in the German Bight: Assessment of Noise Effects Final Report. Prepared for Offshore Forum Windenergie. June.

Cerchio S, Strindberg S, Collins T, Bennett C, Rosenbaum H. 2014. Seismic surveys negatively affect humpback whale singing activity off northern Angola. PLoS One. 9(3):e86464. doi:10.1371/journal.pone.0086464.

Cetacean and Turtle Assessment Program (CETAP). 1982. Characterization of marine mammals and turtles in the Mid- and North Atlantic areas of the U.S. outer continental shelf - final report of the Cetacean and Turtle Assessment Program. Prepared for U.S. Bureau of Land Management, Washington, D.C. by Cetacean and Turtle Assessment Program, University of Rhode Island, Graduate School of Oceanography. Kingston, Rhode Island. https://tethys.pnnl.gov/sites/default/files/publications/A_Characterization_of_Marine_Mammals_and_Turtles.pdf.

Chen C, Beardsley RC, Qi J, Lin H. 2016. Use of finite-volume modeling and the northeast coastal ocean forecast system in offshore wind energy resource planning. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 131 p. Report No.: BOEM 2016-050.

Chen Z, Curchitser E, Chant R, Kang D. 2018. Seasonal variability of the cold pool over the mid-Atlantic Bight continental shelf. Journal of Geophysical Research: Oceans. 123(11):8203-8226.

Christiansen N, Daewel U, Djath B, and Schrum C. 2022. Emergence of large-scale hydrodynamic structures due to atmospheric offshore wind farm wakes. Frontiers in Marine Science 9:818501.

Clark CW, Brown MW, Corkeron P. 2010. Visual and acoustic surveys for north Atlantic right whales, *Eubalaena glacialis*, in Cape Cod Bay, Massachusetts, 2001–2005: management implications. Marine Mammal Science 26(4):837-854.

Coates DA, Deschutter Y, Vincx M, Vanaverbeke J. 2014. Enrichment and shifts in macrobenthic assemblages in an offshore wind farm area in the Belgian part of the North Sea. Marine Environmental Research 95:1-12.

Cole TVN, Hamilton P, Henry AG, Duley P, R.M. Pace III, White BN, Frasier T. 2013. Evidence of a North Atlantic right whale *Eubalaena glacialis* mating ground. Endangered Species Research 21:55-64.

Committee on Taxonomy. 2021. List of marine mammal species and subspecies. Society for Marine Mammalogy. [accessed 2022 Jun 09]. https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/.

Conn P, Silber K. 2013. Vessel speed restrictions reduce risk of collision-related mortality for North Atlantic right whales. Ecosphere: 4(4).

Cox TM, Ragen TJ, Read AI, Vos F, Baird RW, Balcomb K, Barlow J, Caldwell J, Cranford T, Crum L, D'Amico A, D'Spain G, Fernández A, Finneran J, Gentry R, Gerth W, Gulland F, Hildebrand J, Houser D, Hullar T, Jepson PD, Ketten D, MacLeod CD, Miller P, Moore S, Mountain D, Palka D, Ponganis P, Rommel S, Rowles T, Taylor B, Tyack P, Wartzok D, Gisiner R, Mead J, Benner L. 2006. Understanding the impacts of anthropogenic sound on beaked whales. J. Cetacean Res. Manage 7(3):177–187.

Cremer MJ, Barreto AS, Hardt FAS, Júnior AJT, Mounayer R. 2009. Cetacean occurrence near an offshore oil platform in southern Brazil. Biotemas 23(3):247-251.

Crocker SE, Fratantonio FD. 2016. Characteristics of sounds emitted during high-resolution marine geophysical surveys. Prepared for Bureau of Ocean Energy Management by Naval Undersea Warfare Center Division Newport, Rhode Island. Report No.: OCS Study BOEM 2016-044 NUWC-NPT Technical Report 12,203.

Croll DA, Tershy BR, Acevedo A, Levin P. 1999. Marine vertebrates and low frequency sound. Split in 2 parts. University of California Santa Cruz, Institute of Marine Sciences, Marine Mammal and Seabird Ecology Group: Sanat Cruz, CA. 473 p. https://aquadocs.org/bitstream/handle/1834/35442/ Croll%20et%20al.%20-%201999.pdf?sequence=1.

D'Amico AD, Gisiner RC, Ketten DR, Hammock JA, Johnson C, Tyack PL, Mead J. 2009. Beaked whale strandings and naval exercises. Aquatic Mammals 35:452–472.

Daewel U, Akhtar N, Christiansen N, Schrum C. 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Communications Earth & Environment 3(292).

Dahne M, Gilles A, Lucke K, Peschko V, Adler S, Krugel K, Sundermeyer J, Siebert U. 2013. Effects of pile-driving on harbour porpoises (*Phocoena phocoena*) at the first offshore wind farm in Germany. Environmental Research Letters. 8:16 pp-16 pp. doi:10.1088/1748-9326/8/2/025002.

Dahne M, Tougaard J, Carstensen J, Rose A, Nabe-Nielsen J. 2017. Bubble curtains attenuate noise from offshore wind farm construction and reduce temporary habitat loss for harbour porpoises. Marine Ecology Progress Series 580:221–237.

Davis GE, Baumgartner MF, Bonnell JM, Bell J, Berchok C, Bort Thornton J, Brault S, Buchanan G, Charif RA, Cholewiak D. 2017. Long-term passive acoustic recordings track the changing distribution of north Atlantic right whales (*Eubalaena glacialis*) from 2004 to 2014. Scientific Reports 7(1):13460.

Davis GE, Baumgartner MF, Corkeron PJ, Bell J, Berchok C, Bonnell JM, Bort Thornton J, Brault S, Buchanan GA, Cholewiak DM. 2020. Exploring movement patterns and changing distributions of baleen whales in the western North Atlantic using a decade of passive acoustic data. Global Change Biology 26(9):4812-4840.

Denes SL, Weirathmueller MM, Zeddies DG. 2020. Foundation installation at South Fork Wind Farm: animal exposure modelling. Technical report by JASCO Applied Sciences for Jacobs Engineering Group Inc. Silver Spring (MD). 154 p. [accessed 2022 Jun 22]. https://www.boem.gov/sites/ default/ files/documents/oil-gas-energy/AnimalExposureModelingFoundationInstallation.pdf.

Department of Navy (DoN). 2005. Marine resources assessment for the Northeast operating areas: Atlantic City, Narragansett Bay, and Boston. Norfolk, Virginia: Department of the Navy, U.S. Fleet Forces Command.

Di Iorio L, Clark CW. 2010. Exposure to seismic survey alters blue whale acoustic communication. Biology Letters. 6(1):51-54.

DNV-GL. 2022. Navigation safety risk assessment. Appendix X in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. August 2022.

Dolman S, Williams-Grey V, Asmutis-Silvia R, Isaac S. 2006. Vessel collisions and cetaceans: what happens when they don't miss the boat. Chippenham (UK): Whale and Dolphin Conservation Society 25 p.

Dolman SJ, Pinn E, Reid RJ, Barley JP, Deaville R, Jepson PD, O'Connell M, Berrow S, Penrose RS, Stevick PT, Calderan S, Robinson KP, Brownell Jr. RL, Simmonds MP. 2010. A note on the unprecedented strandings of 56 deep-diving whales along the UK and Irish coast. Marine Biodiversity Records 3:e16.

Dorrell RM, Lloyd CJ, Lincoln BJ, Rippeth TP, Taylor JR, Caulfield CP, Sharples J, Pollon JA, Scannel BD, Greaves DM, Hall RA, Simpson JH. 2022. Anthropogenic mixing in seasonally stratified shelf seas by offshore wind farm infrastructure. Front. Mar. Sci. 9, 1–25.

Dunlop RA, Noad MJ, McCauley RD, Scott-Hayward L, Kniest E, Slade R, Paton D, Cato DH. 2017. Determining the behavioural dose-response relationship of marine mammals to air gun noise and source proximity. Journal of Experimental Biology. 220(Pt 16):2878-2886. 10.1242/jeb.160192.

Edwards EF. 2015. Global distribution of fin whales *Balaenoptera physalus* in the post-whaling era (1980–2012). Mammal Review 45:197-214.

Elliott J, Smith K, Gallien DR, Khan A. 2017. Observing cable laying and particle settlement during the construction of the Block Island Wind Farm. Final report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 225 p. Report No. BOEM 2017-027.

Elliott J, Khan AA, Lin YT, Mason T, Miller JH, Newhall AE, Potty GR, Vigness-Raposa KJ. 2019. Field observations during wind turbine operations at the Block Island Wind Farm, Rhode Island. Final report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 281 p. OCS Study BOEM 28 (2019).

Elliott J, Khan AA, Ying-Tsong L, Mason T, Miller JH, Newhall AE, Potty GR, Vigness-Raposa KJ. 2019. Field observations during wind turbine operations at the Block Island wind farm, Rhode Island. Final Report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2019-028. https://espis.boem.gov/final%20reports/BOEM_2019-028.pdf.

English PA, Mason TI, Backstrom JT, Tibbles BJ, Mackay AA, Smith MJ, Mitchell T. 2017. Improving efficiencies of National Environmental Policy Act documentation for offshore wind facilities case studies report. Prepared for U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs by Fugro Marine GeoServices Inc. and Fugro GB Marine Ltd. 296 p. Report No. BOEM 2017-026.

Erbe C, Dunlop R, Dolman S. 2018. Chapter 10: Effects of noise on marine mammals. 277-309 p. In: Slabbekoorn H, Dooling RJ, Popper AN, Fay RR (Eds). Effects of anthropogenic noise on animals, Springer Handbook of Auditory Research. ASA Press and Springer. Slabbekoorn.

Erbe C, Marley SA, Schoeman RP, Smith JN, Trigg LE, Embling CB. 2019. The effects of ship noise on marine mammals—a review. Frontiers in Marine Science 6:606.

Estabrook BJ, Hodge KB, Salisbury DP, Rahaman A, Ponirakis D, Harris DV, Zeh JM, Parks SE, Rice AN. 2021. Final report for New York Bight whale monitoring passive acoustic surveys October 2017-October 2020. East Setauket, NY: Prepared for Division of Marine Resources, New York State Department of Environmental Conservation, Albany, NY by K. Lisa Yang Center for Conservation Bioacoustics, Cornell Lab of Ornithology, Cornell University, Ithaca, NY.

Exponent Engineering P.C. 2018. Deepwater Wind South Fork Wind Farm offshore electric and magnetic field assessment. Appendix K1 in Construction and Operations Plan South Fork Wind Farm. New York, New York: Exponent Engineering, P.C.

Exponent Engineering P.C. 2022. Offshore DC and AC Electric-and Magnetic Field Assessment. Appendix J1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. August 2022.

Fernández A, Edwards JF, Rodríguez F, Espinosa de los Monteros A, Herráez P, Castro P, Jaber JR, Martín V, Arbelo M. 2005. 'Gas and fat embolic syndrome' involving a mass stranding of beaked whales (family Ziphiidae) exposed to anthropogenic sonar signals. Vet. Pathol. 42:446–457.

Floeter J, Pohlmann T, Harmer A, Mollmann C. 2022. Chasing the offshore wind farm windwake-induced upwelling/downwelling dipole. Frontiers in Marine Science 9:884943.

Gardline. 2021a. Protected species observer interim report for the Sunrise Wind Offshore Wind Farm 2020 and 2021 geotechnical survey. Norfolk (England). 83 p.

Gardline. 2021b. Protected species observer technical summary report for the Sunrise Wind Offshore Wind Farm geophysical survey 2019-2020. Norfolk (England). 75 p.

Garrigue C, Greaves J. 2001. Cetacean records for the New Caledonian area (Southwest Pacific Ocean). Micronesica 34(1):27-33.

Garrison LP, Rosel PE, Hohn A, Baird R, Hoggard W. 2003. Abundance of the coastal morphotype of bottlenose dolphin, *Tursiops truncatus*, in U.S. continental shelf waters between New Jersey and Florida during winter and summer 2002. NOAA Fisheries, Southeast Fisheries Science Center.

Garrison LP, Rosel PE. 2017. Partitioning short-finned and long-finned pilot whale bycatch estimates using habitat and genetic information. 75 Virginia Beach Dr., Miami, FL 33140: Southeast Fisheries Science Center, Protected Resources and Biodiversity Division. 24 p. Report No.: PRBD Contribution # PRBD-2016-17.

Gilbert JR, Guldager N. 1998. Status of harbor and gray seal populations in northern New England. Woods Hole, Massachusetts: National Marine Fisheries Service.

Graham IM, Pirotta E, Merchant ND, Farcas A, Barton TR, Cheney B, Hastie GD, Thompson PM. 2017. Responses of bottlenose dolphins and harbor porpoises to impact and vibration piling noise during harbor construction. Ecosphere. 85(6):1-16.

Grieve BD, Hare JA, Saba VS. 2017. Projecting the effects of climate change on *Calanus finmarchicus* distribution within the U.S. Northeast Continental Shelf. Scientific Reports 7(1):6264.

Hamilton PK, Mayo CA. 1990. Population characteristics of right whales (*Eubalaena glacialis*) observed in Cape Cod and Massachusetts Bays, 1978-1986. Reports of the International Whaling Commission (Special Issue 12):203-208.

Hammar L, Andersson S, Rosenberg R. 2010. Adapting offshore wind power foundations to local environment. Prepared for the Swedish Environmental Protection Agency by Vindval. 87 p. https://tethys.pnnl.gov/publications/adapting-offshore-wind-power-foundations-local-environment.

Hammill MO, Stenson GB, Myers RA, Stobo WT. 1998. Pup production and population trends of the grey seal (*Halichoerus grypus*) in the Gulf of St. Lawrence. Canadian Journal of Fisheries and Aquatic Sciences 55:423-430.

Hannay D, Zykov M. 2022. Underwater acoustic modeling of detonations of unexploded ordnance (UXO) for Ørsted wind farm construction, U.S. east coast. Document 02604, Version 3.0. Report by JASCO Applied Sciences for Ørsted.

Harry CT, DiGiovanni Jr. RA, Walton WJ, Barco SG. 2005. Characterizing stranding trends in Virginia and North Carolina from 2000-2005. In: Abstracts, Sixteenth Biennial Conference of the Biology of Marine Mammals; 12-16 December 2005; San Diego, California. 122 p.

Hatch LT, Clark CW, Van Parijs SM, Frankel AS, Ponirakis DW. 2012. Quantifying loss of acoustic communication space for right whales in and around a U.S. national marine sanctuary. Conservation Biology 26(6):983-994.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE. 2018. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2017 (second edition). Woods Hole, Massachusetts: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center. 378 p. Report No. NOAA Technical Memorandum NMFS-NE-245.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE. 2020. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2019. Woods Hole, Massachusetts: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center. NOAA Technical Memorandum NMFS-NE-264.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE, Turek J (Eds). 2021. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2020. Woods Hole, Massachusetts: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center. 403 p. Report No. NOAA Technical Memorandum NMFS-NE-271.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE, Wallace J (Eds). 2022. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2021. Woods Hole (MA): U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northeast Fisheries Science Center. 387 p. Report No.: NOAA Technical Memorandum NMFS-NE-271.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE, McCordic J, Wallace J (Eds). 2023. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2022. Woods Hole (MA): U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries

Service, Northeast Fisheries Science Center. 262 p. Report No.: NOAA Technical Memorandum NMFS-NE-304.

Hazel J, Lawler I, Marsh H, Robson S. 2007. Vessel speed increases collision risk for the green turtle Chelonia mydas. Endangered Species Research 3:105–113.

HDR. 2019. Field observations during wind turbine operations at the Block Island Wind Farm, Rhode Island. Final report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 281 p. Report No. OCS Study BOEM 2019-028.

Holt MM, Noren DP, Veirs V, Emmons CK, Veirs S. 2009. Speaking up: killer whales (*Orcinus orca*) increase their call amplitude in response to vessel noise. Journal of the Acoustical Society of America. 125:EL27-EL32.

Horwood J. 1987. The sei whale: population biology, ecology, & management. New York, New York: Croom Helm in association with Methuen, Inc. 375 p.

Hutchison ZL, Sigray P, He H, Gill A, King J, Gibson C. 2018. Electromagnetic field (EMF) impacts on elasmobranch (shark, rays, and skates) and American lobster movement and migration from direct current cables. Prepared for U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs by The Coastal Mapping Laboratory, Graduate School of Oceanography, University of Rhode Island. OCS Study BOEM 2018-003.

Jansen E, de Jong C. 2016. Underwater noise measurements in the North Sea in and near the Princess Amalia Wind Farm in operation. Proceedings of the Inter-Noise 2016 Conference, August 21–24 Hamburg, Germany.

JASCO Applied Sciences. 2022a. New England Wind Offshore Wind Farm: application for Marine Mammal Protection Act (MMPA) rulemaking and letter of authorization. Version 8.0, Document 01648. Prepared for Park City Wind, LLC by JASCO Applied Sciences. 567 p.

JASCO Applied Sciences. 2022b. Atlantic Shores Offshore Wind: application for Marine Mammal Protection Act (MMPA) rulemaking and letter of authorization. Final version, Document No. 02562. Prepared for Atlantic Shores Offshore Wind, LLC by JASCO Applied Sciences. 201 p.

Jefferson TA, Fertl D, Bolaños-Jiménez J, Zerbini AN. 2009. Distribution of common dolphins (*Delphinus* spp.) in the western Atlantic Ocean: A critical re-examination. Marine Biology 156:1109-1124.

Jefferson TA, Webber MA, Pitman RL. 2015. Marine mammals of the world: a comprehensive guide to their identification. Second edition. San Diego, California: Academic Press.

Jensen AS, Silber GK, Calambokidis J. 2003. Large whale ship strike database. U.S. Department of Commerce (p. 37). NOAA Technical Memorandum. NMFS-ORP. https://repository.library.noaa.gov/view/noaa/23127/noaa_23127_DS1.pdf.

Jensen FH, Bejder L, Wahlberg M, N. Aguilar Soto, Johnson M, Madsen PT. 2009. Vessel noise effects on delphinid communication. Marine Ecology Progress Series 395:161-175.

Jepson P, Deaville R, Barber J, Brownlow A, Barnett J, Berrow S, Cunningham AA, Davison NJ, Ten Doeschate M, Esteban R, Ferreira M, Foote AD, Genov T, Giménez J, Loveridge J, Llavona Á, Martin V, Maxwell DL, Papachlimitzou A, Penrose R, Perkins MW, Smith B, de Stephanis R, Tregenza N, Verborgh P, Fernandez A, Law RJ. 2016. PCB pollution continues to impact populations of orcas and other dolphins in European waters. Sci Rep 6:18573.

Jepson PD, Arbelo M, Deaville R, Patterson IAP, Castro P, Baker JR, Degollada E, Ross HM, Herraez P, Pocknell AM, Rodriguez F, Howie FE, Espinosa A, Reid RJ, Jaber JR, Martin V, Cunningham AA, Fernández A. 2003. Gas-bubble lesions in stranded cetaceans. Nature 425:575–576.

Johnson SR, Richardson WJ, Yazvenko SB, Blokhin SA, Gailey G, Jenkerson MR, Meier SK, Melton HR, Newcomer MW, Perlov AS. 2007. A western gray whale mitigation and monitoring program for a 3-D seismic survey, Sakhalin Island, Russia. Environ Monit Assess. 134(1-3):1-19. doi:10.1007/s10661-007-9813-0.

Johnson TL, van Berkel JJ, Mortensen LO, Bell MA, Tiong I, Hernandez B, Snyder DB, Thomsen F, Svenstrup PO. 2021. Hydrodynamic modeling, particle tracking and agent-based modeling of larvae in the U.S. Mid-Atlantic Bight. Lakewood (CO): U.S. Department of the Interior, Bureau of Ocean Energy Management. 232 p.

Jones DV, Rees DR. 2021. Haul-out counts and photo-identification of pinnipeds in Chesapeake Bay and Eastern Shore, Virginia: 2019/2020 annual progress report. Final Report. Norfolk, Virginia: Prepared for U.S. Fleet Forces Command. 45 p.

Josephson E, Wenzel F, Lyssikatos MC. 2021. Serious injury determinations for small cetaceans and pinnipeds caught in commercial fisheries off the northeast U.S. coast, 2014–2018. Washington (DC): U.S. Department of Commerce. 38 p. Report No. Northeast Fisheries Science Center Reference Document 21-04.

Kastelein RA, Huijser LAE, Cornelisse S, Helder-Hoek L, Jennings N, de Jong CAF. 2019. Effect of Pile-Driving Playback Sound Level on Fish-Catching Efficiency in Harbor Porpoises (*Phocoena phocoena*). Aquatic Mammals. 45(4):398-410. doi:10.1578/am.45.4.2019.398.

Katona SK, Beard JA. 1990. Population size, migrations and feeding aggregations of the humpback whale (*Megaptera novaeangliae*) in the western North Atlantic Ocean. Reports of the International Whaling Commission (Special Issue 12):295-305.

Katona SK, Rough V, Richardson DT. 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. 316 p. Washington, D.C.: Smithsonian Institution Press.

Kellar NM, Speakman TR, Smith CR, Lane SM, Balmer BC, Trego ML, Catelani KN, Robbins MN, Allen CD, Wells RS. 2017. Low reproductive success rates of common bottlenose dolphins *Tursiops truncatus* in the northern Gulf of Mexico following the Deepwater Horizon disaster (2010-2015). Endangered Species Research 33.

Kelley DE, Vlasic JP, Brillant SW. 2021. Assessing the lethality of ship strikes on whales using simple biophysical models. Marine Mammal Science. 37(1):251-267. DOI:https://doi.org/10.1111/mms.12745.

Kenney RD, Vigness-Raposa KJ. 2010. Technical report 10. Marine mammals and sea turtles of Narragansett Bay, Block Island Sound, Rhode Island Sound, and nearby waters: an analysis of existing data for the Rhode Island Ocean Special Area Management Plan. Wakefield, Rhode Island: Rhode Island Coastal Resources Management Council. Appendix A, 634-970 p. For FULL appendix – P:\Marine Sciences\Endnote\Scanned PDF Literature\Rhode Island Ocean SAMP 2010\Appendices\Appendix A-full.

Kenney RD, Winn HE, Macaulay MC. 1995. Cetaceans in the Great South Channel, 1979-1989: Right whale (*Eubalaena glacialis*). Continental Shelf Research 15:385-414.

Kenney RD, Winn HE. 1987. Cetacean biomass densities near submarine canyons compared to adjacent shelf/slope areas. Continental Shelf Research 7:107-114.

Kenney RD. 1990. Bottlenose dolphins off the northeastern United States.369-386 p. In: Leatherwood S, Reeves RR (Eds). The bottlenose dolphin. San Diego, California: Academic Press.

Kenney RD. 2001. Anomalous 1992 spring and summer right whale (*Eubalaena glacialis*) distributions in the Gulf of Maine. Journal of Cetacean Research and Management (Special Issue 2):209-223.

Kirkpatrick AJ, Benjamin S, DePiper GS, Murphy T, Steinback S, Demarest C. 2017. Socio-economic impact of outer continental shelf wind energy development on fisheries in the U.S. Atlantic. volume I—report narrative. Washington (D.C.): U.S Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 154 p. Report No. BOEM 2017-012.

Kirschvink JL. 1990. Geomagnetic sensitivity in cetaceans: an update with live stranding records in the United States. Sensory Abilities of Cetaceans. NATO ASI Series, vol 196. Springer, Boston, MA.

Kite-Powell H, Knowlton A, Brown M. 2007. Modeling the effect of vessel speed on right whale ship strike risk. Prepared for NOAA/NMFS Project NA04NMF47202394. Woods Hole, Massachusetts: Woods Hole Oceanographic Institute.

Knowlton AR, Hamilton PK, Marx MK, Pettis HM, Kraus SD. 2012. Monitoring North Atlantic right whale *Eubalaena glacialis* entanglement rates: a 30 yr retrospective. Marine Ecology Progress Series 466:293-302.

Knowlton AR, Kraus SD. 2001. Mortality and serious injury of northern right whales (*Eubalaena glacialis*) in the western North Atlantic Ocean. Journal of Cetacean Research and Management (Special Issue 2):193-208.

Knowlton AR, Hamilton PK, Marx MK, Pettis HM, Kraus SD. 2012. Monitoring north Atlantic right whale *Eubalaena glacialis* entanglement rates: a 30 yr retrospective. Marine Ecology Progress Series 466: 293–302.

Knowlton AR, Robbins J, Landry S, McKenna HA, Kraus SD, Werner TB. 2016. Effects of fishing rope strength on the severity of large whale entanglements. Conservation Biology 30(2):318-328.

Kohut J, Brodie J. 2019. Partners in science workshop: offshore wind and the Mid-Atlantic cold pool. Tuckerton, New Jersey: Jacques Cousteau National Estuarine Research Reserve.

https://rucool.marine.rutgers.edu/wp-content/uploads/2020/10/PartnersWorkshop_WhitePaper_Final.pdf.

Kraus SD, Brown MW, Caswell H, Clark CW, Fujiwara M, Hamilton PK, Kenney RD, Knowlton AR, Landry S, Mayo CA, McLellan WA, Moore MJ, Nowacek DP, Pabst DA, Reed AJ, Rolland RM. 2005. North Atlantic right whales in crisis. Science 309:561-562.

Kraus SD, Kenney RD, Thomas L. 2019. A framework for studying the effects of offshore wind development on marine mammals and turtles. Prepared for the Massachusetts Clean Energy Center and the Bureau of Ocean Energy Management by the Anderson Cabot Center for Ocean Life and the Centre for Research into Ecological and Environmental Modelling. 48 p.

Kraus SD, Leiter S, Stone K, Wikgren B, Mayo C, Hughes P, Kenney RD, Clark CW, Rice AN, Estabrook B, Tielens J. 2016. Northeast large pelagic survey collaborative aerial and acoustic surveys for large whales and sea turtles. OCS Study BOEM 2016-054. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management.

Kraus SD, Leiter SM, Wikgren B, Kenney RD, Mayo C, Hughes P, Tielens JT, Estabrook BJ, Rice AN. 2014. Aerial and acoustic surveys of whales and sea turtles for offshore wind energy planning in Massachusetts: Year 2 report. Prepared for Massachusetts Clean Energy Center by New England Aquarium, University of Rhode Island, Provincetown Center for Coastal Studies, and Cornell's Bioacoustics Research Program.

Kraus SD, Taylor JKD, Wikgren B, Kenney RD, Mayo C, Ganley L, Hughes P, Clark CW, Rice AN. 2013. Field surveys of whales and sea turtles for offshore wind planning in Massachusetts 2011-2012. Prepared for Massachusetts Clean Energy Center by New England Aquarium, University of Rhode Island, Provincetown Center for Coastal Studies, and Cornell's Bioacoustics Research Program.

Küsel ET, Weirathmueller MJ, Koessler MW, Zammit KE, Quijano JE, Kanu C, Limpert KE, Clapsaddle ME, Zeddies DG. 2022. Underwater noise and exposure modeling. Appendix I1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. April 2022.

LaBrecque E, Curtice C, Harrison J, Parijs SMV, Halpin PN. 2015. Biologically important areas for cetaceans within U.S. waters – East Coast region. Aquatic Mammals 41(1):17-29.

Laist DW, Knowlton AR, Mead JG, Collet AS, Podesta M. 2001. Collisions between ships and whales. Marine Mammal Science 17(1):35-75.

Laist DW. 1997. Impacts of marine debris: Entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. 99-139 p. In: Coe JM, Rogers DB (Eds). Marine debris: sources, impacts, and solutions. New York, New York: Springer-Verlag.

Langhamer O. 2012. Artificial reef effect in relation to offshore renewable energy conversion: state of the art. The Scientific World Journal 2012:8.

Lentz SJ. 2017. Seasonal warming of the Middle Atlantic Bight cold pool. Journal of Geophysical Research: Oceans 122(2):941-954.

Lesage V, Barrette C, Kingsley MCS, Sjare B. 1999. The effect of vessel noise on the vocal behavior of belugas in the St. Lawrence River estuary, Canada. Marine Mammal Science. 15(1):65-84. doi:10.1111/j.1748-7692.1999.tb00782.x.

Lesage V, Hammill MO. 2001. The status of the grey seal, *Halichoerus grypus*, in the Northwest Atlantic. Canadian Field-Naturalist 115(4):653-662.

Lewison R, Crowder L, Wallace B. 2014. Global patterns of marine mammal, seabird, and sea turtle bycatch reveal taxa-specific and cumulative megafauna hotspots. Proceedings of the National Academy of Sciences 111(14): 5271-5276.

Lindeboom HJ, Kouwenhoven HJ, Bergman MJN, Bouma S, Brasseur S, Daan R, Fijn RC, de Haan D, Dirksen S, van Hal R. 2011. Short-term ecological effects of an offshore wind farm in the Dutch coastal zone; a compilation. Environmental Research Letters 6(3):035101.

Linden DW. 2023. Population size estimation of North Atlantic right whales from 1990-2022. NOAA Technical Memorandum NMFS-NE-314. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

Ljungblad DK, Wursig B, Swartz SL, Keene JM. 1988. Observations on the behavioral responses of bowhead whales (*Balaena mysticetus*) to active geophysical vessels in the Alaskan Beaufort Sea. Arctic. 41:183-194.

Long C. 2017. Analysis of the possible displacement of bird and marine mammal species related to the installation and operation of marine energy conversion systems. Scottish Natural Heritage Commissioned Report No. 947.

MacLeod CD. 2009. Global climate change, range changes and potential implications for the conservation of marine cetaceans: A review and synthesis. Endangered Species Research 7:125-136.

Madsen PT, Wahlberg M, Tougaard J, Lucke K, Tyack P. 2006. Wind turbine underwater noise and marine mammals: Implications of current knowledge and data needs. Marine Ecology Progress Series 309:279-295.

Malme CI, Wursig B, Bird JE, Tyack P. 1986. Behavioral responses of gray whales to industrial noise: Feeding observations and predictive modeling. Final report. Outer Continental Shelf Environmental Assessment Program Research Unit 675. 207 p.

Martin J, Sabatier W, Gowan TA, Giraud C, Gurarie E, Calleson CS, Ortega-Ortiz JG, Deutsch CJ, Rycyk A, Koslovsky SM. 2016. A quantitative framework for investigating risk of deadly collisions between marine wildlife and boats. Methods in Ecology and Evolution 7:42-50.

Mate BR, Stafford KM, Nawojchik R, Dunn JL. 1994. Movements and dive behavior of a satellite-monitored Atlantic white-sided dolphin (*Lagenorhynchus acutus*) in the Gulf of Maine. Marine Mammal Science 10(1):116-121.

Mayo CA, Ganley L, Hudak CA, Brault S, Marx MK, Burke E, Brown MW. 2018. Distribution, demography, and behavior of North Atlantic right whales (*Eubalaena glacialis*) in Cape Cod Bay, Massachusetts, 1998–2013. Marine Mammal Science 34:979-996.

Mazet JA, Gardner IA, Jessup DA, Lowenstine LJ. 2001. Effects of petroleum on mink applied as a model for reproductive success in sea otters. Journal of Wildlife Diseases 37(4):686-692.

McCauley RD, Jenner MN, Jenner C, McCabe KA, Murdoch J. 1998. The response of humpback whales (*Megaptera novaeangliae*) to offshore seismic survey noise: Preliminary results of observations about a working seismic vessel and experimental exposures. Australian Petroleum Production and Exploration Association Journal. 38:692-707.

McConnell BJ, Fedak MA, Lovell P, Hammond PS. 1999. Movements and foraging areas of grey seals in the North Sea. Journal of Applied Ecology 36:573-590.

Mid-Atlantic Fishery Management Council (MAFMC). 2023. Mid-Atlantic artificial reefs. [accessed 2023 Mar 3] https://www.mafmc.org/artificial-reefs.

Mikkelsen L, Mouritsen KN, Dahl K, Teilmann J, Tougaard J. 2013. Re-established stony reef attracts harbour porpoises *Phocoena phocoena*. Marine Ecology Progress Series 481:239-248.

Miller JH, Potty GR. 2017. Measurements of underwater sound radiated from an offshore wind turbine. The Journal of the Acoustical Society of America 142(4):2699.

Minerals Management Service (MMS). 2007. Programmatic environmental impact statement for alternative energy development and production and alternate use of facilities on the outer continental shelf. Final environmental impact statement. Volume I: executive summary through chapter 4. Herndon, Virginia: U.S. Department of the Interior. Report No. OCS EIS/EA MMS 2007-046.

Mohr FC, Lasley B, Bursian S. 2008. Chronic oral exposure to bunker C fuel oil causes adrenal insufficiency in ranch mink (*Mustela vison*). Archives of Environmental Contamination and Toxicology 54(2):337-347.

Moore SE, Clarke JT. 2002. Potential impact of offshore human activities on gray whales (*Eschrichtius robustus*). Journal of Cetacean Research and Management. 4(1):19-25.

Moore MJ, van der Hoop JM. 2012. The painful side of trap and fixed net fisheries: chronic entanglement of large whales. Journal of Marine Biology 2012:230653.

Muir DCG, Norstrom RJ, Simon M. 1988. Organochlorine contaminants in arctic marine food chains: accumulation of specific polychlorinated biphenyls and chlordane-related compounds. Environmental Science & Technology 22(9):1071-1079.

Mullin KD, Fulling GL. 2003. Abundance of cetaceans in the southern U.S. North Atlantic Ocean during summer 1998. Fishery Bulletin 101:603-613.

Mussoline SE, Risch D, Hatch LT, Weinrich MT, Wiley DN, Thompson MA, Corkeron PJ, Van Parijs SM. 2012. Seasonal and diel variation in North Atlantic right whale up-calls: implications for management and conservation in the northwestern Atlantic Ocean. Endangered Species Research 17:17-26.

National Academies of Sciences, Engineering, and Medicine (NASEM). 2023. Potential hydrodynamic impacts of offshore wind energy on Nantucket Shoals regional ecology: an evaluation from wind to whales. Washington, D.C: The National Academies Press. https://doi.org/10.17226/27154.

National Marine Fisheries Service (NMFS). 2005. Endangered Fish and Wildlife; Notice of Intent to Prepare an Environmental Impact Statement. Federal Register 70(7):1871–1875. Available: https://www.govinfo.gov/content/pkg/FR-2005-01-11/pdf/05-525.pdf. National Marine Fisheries Service (NMFS). 2008. Endangered fish and wildlife; Final rule to implement speed restrictions to reduce the threat of ship collisions with North Atlantic right whales. Federal Register 73(198):60173-60191.

National Marine Fisheries Service (NMFS). 2016a. Endangered and threatened species; critical habitat for endangered North Atlantic right whale. Federal Register. 4838-4874 p.

National Marine Fisheries Service (NMFS). 2016b. Endangered Species Act section 7 consultation on the continued prosecution of fisheries and ecosystem research conducted and funded by the Northeast Fisheries Science Center and the issuance of a letter of authorization under the Marine Mammal Protection Act for the incidental take of marine mammals pursuant to those research activities. PCTS ID: NER-2015-12532.

National Marine Fisheries Service (NMFS). 2016c. Final programmatic environmental assessment for fisheries research conducted and funded by the Northeast Fisheries Science Center. Prepared for Northeast Fisheries Science Center, National Marine Fisheries Service by URS Group.

National Marine Fisheries Service (NMFS). 2018. 2018 Revision to: Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (Version 2.0). Underwater acoustic thresholds for onset of permanent and temporary threshold shifts. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. NOAA Technical Memorandum NMFS-OPR-59.

National Marine Fisheries Service (NMFS). 2020. Endangered Species Act section 7 consultation biological opinion: construction, operation, maintenance, and decommissioning of the Vineyard Wind Offshore Energy Project (Lease OCS-A 0501). National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office. Report No.: GAFO-2019-00343.

National Marine Fisheries Service (NMFS). 2022. Multi-species pile driving calculator. Version 1.2. Excel file. Updated August 2022. [accessed 2022 Oct 15]. https://media.fisheries.noaa.gov/2022-09/BLANK%20Multi-Species%20%28AUGUST%202022b%29%20PUBLIC_508_OPR1.xlsx.

National Oceanic and Atmospheric Administration (NOAA). 2022. Section 7 effect analysis: turbidity in the Greater Atlantic Region. National Oceanic and Atmospheric Administration, U.S. Department of Commerce. [accessed 2022 Oct 15]. https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-effect-analysis-turbidity-greater-atlantic-region.

National Oceanic and Atmospheric Administration- Fisheries (NOAA Fisheries). 2022a. 2016–2022 humpback whale unusual mortality event along the Atlantic coast. National Oceanic and Atmospheric Administration, Department of Commerce. [accessed 2022 Jun 9]. https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2022-humpback-whale-unusual-mortality-event-along-atlantic-coast.

National Oceanic and Atmospheric Administration- Fisheries (NOAA Fisheries). 2022b. 2017–2022 minke whale unusual mortality event along the Atlantic coast. National Oceanic and Atmospheric Administration, Department of Commerce. [accessed 2022 Jun 09]. https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2022-minke-whale-unusual-mortality-event-along-atlantic-coast.

National Oceanic and Atmospheric Administration- Fisheries (NOAA Fisheries). 2022d. 2018–2020 pinniped unusual mortality event along the Northeast coast. National Oceanic and Atmospheric Administration, Department of Commerce. [accessed 2022 Jun 09]. https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/2018-2020-pinniped-unusual-mortality-event-along.

National Oceanic and Atmospheric Administration- Fisheries (NOAA Fisheries). 2023a. 2017–2023 North Atlantic right whale unusual mortality event. National Oceanic and Atmospheric Administration, Department of Commerce.; [accessed 2023 Sept 12]. https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2022-north-atlantic-right-whale-unusual-mortality-event#causes-of-the-north-atlantic-right-whale-ume.

National Oceanic and Atmospheric Administration- Fisheries (NOAA Fisheries). 2023b. 2022-2023 pinniped unusual mortality event along the Maine coast. National Oceanic and Atmospheric Administration, Department of Commerce. [accessed 2023 Sept 12]. https://www.fisheries.noaa.gov/marine-life-distress/2022-2023-pinniped-unusual-mortality-event-along-maine-coast.

National Oceanic and Atmospheric Administraion-Marine Debris Program (NOAA-MDP). 2014a. Report on the entanglement of marine species in marine debris with an emphasis on species in the United States. Silver Spring, M: National Oceanic and Atmospheric Administration Marine Debris Program. 28 p.

National Oceanic and Atmospheric Administraion-Marine Debris Program (NOAA-MDP). 2014b. Report on the occurrence and health effects of anthropogenic debris ingested by marine organisms. Silver Spring, MD: National Oceanic and Atmospheric Administration Marine Debris Program. 19 p.

Nedwell J, Howell D. 2004. A review of offshore windfarm related underwater noise sources. 63 p. https://tethys.pnnl.gov/sites/default/files/publications/Nedwell-Howell-2004.pdf.

New York State Energy Research & Development Authority (NYSERDA). 2020. Digital aerial baseline survey of marine wildlife in support of offshore wind energy. Third annual report: Summer 2016–Spring 2019, Sixth interim report. Prepared for New York State Energy Research and Development Authority by Normandeau Associates Inc. with APEM Ltd.

Nichols OC, Kenney RD, Brown MW. 2008. Spatial and temporal distribution of North Atlantic right whales (*Eubalaena glacialis*) in Cape Cod Bay, and implications for management. Fishery Bulletin 106(3):270-280.

Normandeau Associates, Inc. (Normandeau), Exponent Inc., Tricas T, Gill A. 2011. Effects of EMFs from undersea power cables on elasmobranchs and other marine species. Camarillo, California: U.S. Department of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region. OCS Study BOEM 2011-09.

Northridge S. 1996. Seasonal distribution of harbour porpoises in U.S. Atlantic waters. Reports of the International Whaling Commission 46:613-617.

Nowacek DP, Thorne LH, Johnston DW, Tyack PL. 2007. Responses of cetaceans to anthropogenic noise. Mammal Review 37(3):81–115.

O'Brien O, McKenna K, Hodge B, Pendleton D, Baumgartner M, Redfern J. 2021a. Megafauna aerial surveys in the Wind Energy Areas of Massachusetts and Rhode Island with emphasis on large whales. Summary Report – Campaign 5, 2018-2019. U.S. Department of the Interior, Bureau of Ocean Energy Management.

O'Brien O, McKenna K, Pendleton D, Redfern J. 2021b. Megafauna aerial surveys in the wind energy areas of Massachusetts and Rhode Island with emphasis on large whales. Interim Report - Campaign 6A, 2020. U.S. Department of the Interior, Bureau of Ocean Energy Management.

Ordtek. 2022. Munitions and explosives of concern and unexploded ordinance with risk assessment and risk mitigation strategy - confidential. Appendix G2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. August 2022.

Orr TL, Herz SM, Oakley DL. 2013. Evaluation of lighting schemes for offshore wind facilities and impacts to local environments. Prepared for U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Herndon, Virginia by ESS Group Inc. East Providence, Rhode Island. OCS study, BOEM 2013-0116.

Osiecka AN, Jones O, Wahlberg M. 2020. The diel pattern in harbour porpoise clicking behavior is not a response to prey activity. Nature Scientific Reports 10:14876.

Palka D. 1995. Abundance estimate of the Gulf of Maine harbor porpoise. Reports of the International Whaling Commission (Special Issue 16):27-50.

Palka D. 2000. Abundance of the Gulf of Maine/Bay of Fundy harbor porpoise based on shipboard and aerial surveys during 1999. Woods Hole, Massachusetts: National Marine Fisheries Service. [accessed 2023 Jun 10]. noaa_3290_DS1.pdf.

Palka D, Aichinger Dias L, Broughton E, Chavez-Rosales S, Cholewiak D, Davis G, DeAngelis A, Garrison L, Haas H, Hatch J, Hyde K, Jech M, Josephson E, Mueller-Brennan L, Orphanides C, Pegg N, Sasso C, Sigourney D, Soldevilla M, Walsh H. 2021a. Atlantic marine assessment program for protected species: 2015-2019. Appendix I: generalize additive density-habitat models and maps, by species. Washington, DC: U.S. Department of the Interior, Bureau of Ocean Energy Management. 438 p. Report No.: Supplement to Final Report BOEM 2021-051.

Palka D, Aichinger Dias L, Broughton E, Chavez-Rosales S, Cholewiak D, Davis G, DeAngelis A, Garrison L, Haas H, Hatch J, Hyde K, Jech M, Josephson E, Mueller-Brennan L, Orphanides C, Pegg N, Sasso C, Sigourney D, Soldevilla M, Walsh H. 2021b. Atlantic marine assessment program for protected species: 2015-2019. Appendix II: species distribution maps of sightings not used in density-habitat models. Washington, DC: U.S. Department of the Interior, Bureau of Ocean Energy Management. 10 p. Report No.: Supplement to Final Report BOEM 2021-051.

Palka D, Aichinger Dias L, Broughton E, Chavez-Rosales S, Cholewiak D, Davis G, DeAngelis A, Garrison L, Haas H, Hatch J, Hyde K, Jech M, Josephson E, Mueller-Brennan L, Orphanides C, Pegg N, Sasso C, Sigourney D, Soldevilla M, Walsh H. 2021c. Atlantic marine assessment program for protected species: 2015-2019. Appendix III: distribution and abundance patterns by wind energy areas. Washington, DC: U.S. Department of the Interior, Bureau of Ocean Energy Management. 47 p. Report No.: Supplement to Final Report BOEM 2021-051.

Palka D, Aichinger Dias L, Broughton E, Chavez-Rosales S, Cholewiak D, Davis G, DeAngelis A, Garrison L, Haas H, Hatch J, Hyde K, Jech M, Josephson E, Mueller-Brennan L, Orphanides C, Pegg N, Sasso C, Sigourney D, Soldevilla M, Walsh H. 2021d. Atlantic marine assessment program for protected species: FY15 – FY19. Washington, DC: U.S. Department of the Interior, Bureau of Ocean Energy Management. 330 p. Report No.: OCS Study BOEM 2021-051.

Palka D, Read A, Potter C. 1997. Summary of knowledge of white-sided dolphins (*Lagenorhynchus acutus*) from U.S. and Canadian Atlantic waters. Reports of the International Whaling Commission 47:729-734.

Palka D, Chavez-Rosales S, Josephson E, Cholewiak D, Haas HL, Garrison L, Jones M, Sigourney D, Waring G, Jech M, Broughton E, Soldevilla M, Davis G, DeAngelis A, Sasso CR, Winton MV, Smolowitz RJ, Fay G, LaBrecque E, Leiness JB, Dettloff, Warden M, Murray K, Orphanides C. 2017. Atlantic marine assessment program for protected species: 2010-2014. Appendix I. Washington, DC: U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region. 412 p. Report No.: Supplement to Final Report BOEM 2017-071.

Pangerc T, Robinson S, Theobald P, Galley L. 2016. Underwater sound measurement data during diamond wire cutting: first description of radiated noise. In: Proceedings of the Fourth International Conference on the Effects of Noise on Aquatic Life July 10–16 Dublin, Ireland. POMA_AN2016_wirecutting_published.pdf.

Parks SE, Clark CW, Tyack PL. 2007. Short- and long-term changes in right whale calling behavior: the potential effects of noise on acoustic communication. Journal of the Acoustical Society of America. 122(6):3725-3731. doi:10.1121/1.2799904.

Parsons ECM, Dolman D, Wright AJ, Rose NA, Burns WCG. 2008. Navy sonar and cetaceans: just how much does the gun need to smoke before we act? Mar. Pollut. Bull. 56:1248–1257.

Patenaude NJ, Richardson WJ, Smultea MA, Koski WR, Miller GW. 2002. Aircraft sound and disturbance to bowhead and beluga whales during spring in the Alaskan Bering Sea. Marine Mammal Science 18(2):309-335.

Patrician MR, Biedron IS, Esch HC, Wenzel FW, Cooper LA, Hamilton PK, Glass AH, Baumgartner MF. 2009. Evidence of a North Atlantic right whale calf (*Eubalaena glacialis*) born in northeastern U.S. waters. Marine Mammal Science 25(2):462-477.

Payne PM, Heinemann DW. 1993. The distribution of pilot whales (*Globicephala* spp.) in shelf/shelf-edge and slope waters of the Northeastern United States, 1978-1988. Reports of the International Whaling Commission (Special Issue 14):51-68.

Payne PM, Selzer LA, Knowlton AR. 1984. Distribution and density of cetaceans, marine turtles, and seabirds in the shelf waters of the northeastern United States, June 1980 – December 1983, based on shipboard observations. Woods Hole, Massachusetts: National Marine Fisheries Service. https://collections.si.edu/search/results.htm?q=%22Payne%2C+P.+Michael%22.

Perrin WF, Mitchell ED, Mead JG, Caldwell DK, Caldwell MC, van Bree PJH, Dawbin WH. 1987. Revision of the spotted dolphins, *Stenella* spp. Marine Mammal Science 3(2):99-170.

Perry SL, DeMaster DP, Silber GK. 1999. The great whales: History and status of six species listed as endangered under the U.S. Endangered Species Act of 1973. Marine Fisheries Review 61(1):1-74.

Pierce GJ, Santos MB, Murphy S, Learmonth JA, Zuur AF, Rogan E, Bustamante P, Caurant F, Lahaye V, Ridoux V, Zegers BN, Mets A, Addink M, Smeenk C, Jauniaux T, Law RJ, Dabin W, Lopez A, Alonso Farre JM, Gonzalez AF, Guerra A, Gracia-Hartmann M, Reid RJ, Moffat CF, Lockyer C, Boon JP. 2008. Bioaccumulation of persistent organic pollutants in female common dolphins (*Delphinus delphis*) and harbour porpoises (*Phocoena phocoena*) from western European seas: geographical trends, causal factors and effects on reproduction and mortality. Marine Pollution 153(2):401-415.

Pinsky ML, Selden RL, Kitchel ZJ. 2020. Climate-driven shifts in marine species ranges: scaling from organisms to communities. Annual Review of Marine Science 12(1):153-179.

Pugliares KR, French TW, Jones GS, Niemeyer ME, Wilcox LA, Freeman BJ. 2016. First records of the short-finned pilot whale (*Globicephala macrorhynchus*) in Massachusetts, U.S.A: 1980 and 2011. Aquatic Mammals 42(3):357-362.

Pyć C, Zeddies D, Denes S, Weirathmueller M. 2018. Appendix III-M: Revised draft – Supplemental Information for the assessment of potential acoustic and non-acoustic impact producing factors on marine fauna during construction of the Vineyard Wind project. Document 001639, Version 3.1. Prepared by JASCO Applied Sciences (U.S.A.) Inc. for Vineyard Wind.

Quintana E, Kraus S, Baumgartner M. 2019. Megafauna aerial surveys in the Wind Energy Areas of Massachusetts and Rhode Island with emphasis on large whales. Summary report – Campaign 4,

2017-2018. Prepared by New England Aquarium, Anderson Cabot Center for Ocean Life and Woods Hole Oceanographic Institution. OCS Study BOEM 2021-054.

Read AJ, Drinker P, Northridge S. 2006. Bycatch of marine mammals in U.S. and global fisheries. Conservation Biology 20(1):163-169.

Read AJ. 1999. Harbour porpoise *Phocoena phocoena* (Linnaeus, 1758). 323-355 p. In: Ridgway SH, Harrison R (Eds). Handbook of marine mammals. San Diego, California: Academic Press.

Record NR, Runge JA, Pendleton DE, Balch WM, Davies KTA, Pershing AJ, Johnson CL, Stamieszkin K, Ji R, Feng Z, Kraus SD, Kenney RD, Hudak CA, Mayo CA, Chen C, Salisbury JE, Thompson CRS. 2019. Rapid climate-driven circulation changes threaten conservation of endangered North Atlantic right whales. Oceanography 32(2); 162–169.

Revolution Wind. 2022. Construction and operations plan, Revolution Wind Farm Project. Revised July 21, 2022. Prepared for Revolution Wind LLC by vhb. Submitted to Bureau of Ocean Energy Management. 900 p.

Richardson WJ, Miller GW, Greene CR. 1999. Displacement of migrating bowhead whales by sounds from seismic surveys in shallow waters of the Beaufort Sea. The Journal of the Acoustical Society of America. 106(4):2281-2281. http://dx.doi.org/10.1121/1.427801.

Richardson WJ, Greene CR, Malme CI, Thomson DH. 1995. Marine mammals and noise. San Diego, California: Academic Press.

Richardson WJ, Wursig B, Greene Jr. CR. 1986. Reactions of bowhead whales, *Balaena mysticetus*, to seismic exploration in the Canadian Beaufort Sea. Journal of the Acoustical Society of America. 79(4):1,117-111,128.

Robbins P. 2001. Fixed categories in a portable landscape: the causes and consequences of land-cover categorization. Environment and Planning A. 33(1): 161-179.

Robbins J, Mattila DK. 2001. Monitoring entanglements of humpback whales (*Megaptera novaeangliae*) in the Gulf of Maine on the basis of caudal peduncle scarring. Scientific Committee meeting document SC/53/NAH25. International Whaling Commission, Cambridge, UK.

Roberts JJ, Best BD, Mannocci L, Fujioka E, Halpin PN, Palka DL, Garrison LP, Mullin KD, Cole TVN, Khan CB, McLellan WA, Pabst DA, Lockhart GG. 2016. Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. Scientific Reports 6:22615.

Roberts JJ, Yack TM, Halpin PN. 2023. Marine mammal density models for the U.S. Navy Atlantic fleet training and testing (AFTT) study area for the phase IV Navy marine species density database (NMSDD). Document version 1.3. Report prepared for Naval Facilities Engineering Systems Command, Atlantic by the Duke University Marine Geospatial Ecology Lab, Durham, North Carolina.

Rolland RM, Parks SE, Hunt KE, Castellote M, Corkeron PJ, Nowacek DP, Wasser SK, Kraus SD. 2012. Evidence that ship noise increases stress in right whales. Proceedings of the Royal Society B: Biological Sciences 279(1737):2363-2368.

Rone BK, Pace I, Richard M. 2012. A simple photograph-based approach for discriminating between free-ranging long-finned (*Globicephala melas*) and short-finned (*G. macrorhynchus*) pilot whales off the east coast of the United States. Marine Mammal Science 28(2):254-275.

Ruppel CD, Weber TC, Staaterman ER, Labak SJ, Hart PE. 2022. Categorizing active marine acoustic sources based on their potential to affect marine animals. Journal of Marine Science and Engineering. 10(9):1278.

Russell DJF, Brasseur SMJM, Thompson D, Hastie GD, Janik VM, Aarts G, McClintock BT, Matthiopoulos J, Moss SEW, McConnell B. 2014. Marine mammals trace anthropogenic structures at sea. Current Biology 24(14):R638-R639.

Russell DJF, Hastie GD, Thompson D, Janik VM, Hammond PS, Scott-Hayward LAS, Matthiopoulos J, Jones EL, McConnell BJ. 2016. Avoidance of wind farms by harbour seals is limited to pile driving activities. Journal of Applied Ecology 53(6):1642-1652.

Scheidat M, Tougaard J, Brasseur S, Carstensen J, van Polanen Petel T, Teilmann J, Reijnders P. 2011. Harbour porpoises *(Phocoena phocoena)* and wind farms: a case study in the Dutch North Sea. Environmental Research Letters 6(2):025102.

Scheifele PM, Andrew S, Cooper RA, Darre M, Musiek FE, Max L. 2004. Indication of a Lombard vocal response in the St. Lawrence River beluga. Journal of the Acoustical Society of America. 17:1486-1492. doi:10.1121/1.1835508.

Schneider DC, Payne PM. 1983. Factors affecting haul-out of harbor seals at a site in southeastern Massachusetts. Journal of Mammalogy 64(3):518-520.

Schofield O, Chant R, Cahill B, Castelao R, Gong D, Kahl A, Kohut J, Montes-Hugo M, Ramadurai R, Ramey P, Yi X. 2008. The decadal view of the mid-Atlantic Bight from the COOLroom: is our coastal system changing? Oceanography 21(4):108-117.

Schroeder CL. 2000. Population status and distribution of the harbor seal in Rhode Island waters [Master's thesis]. University of Rhode Island.

Schultze LKP, Merckelbach LM, Horstmann J, Raasch S, Carpenter JR. 2020. Increased mixing and turbulence in the wake of offshore wind farm foundations. Journal of Geophysical Research: Oceans 125(8):e2019JC015858.

Scott TM, Sadove SS. 1997. Sperm whale, *Physeter macrocephalus*, sightings in the shallow shelf waters off Long Island, New York. Marine Mammal Science 13(2):317-321.

Selzer LA, Payne PM. 1988. The distribution of white-sided (*Lagenorhynchus acutus*) and common dolphins (*Delphinus delphis*) vs. environmental features of the continental shelf of the northeastern United States. Marine Mammal Science 4(2):141-153.

Sharp SM, McLellan WA, Rotstein DS, Costidis AM, Barco SG, Durham K, Pitchford TD, Jackson KA, Daoust PY, Wimmer T. 2019. Gross and histopathologic diagnoses from North Atlantic right whale *Eubalaena glacialis* mortalities between 2003 and 2018. Diseases of Aquatic Organisms 135(1):1-31.

Shimada T., Limpus C, Jones R, Hamann M. 2017. Aligning habitat use with management zoning to reduce vessel strike of sea turtles. Ocean and Coastal Management 142:163–172.

Smith CR, Rowles TK, Hart LB, Townsend FI, Wells RS, Zolman ES, Balmer BC, Quigley B, Ivancic M, McKercher W, Tumlin MC, mullin KD, Adams JD, Wu Q, McFee W, Collier T, Schwacke LH. 2017. Slow recovery of Barataria Bay dolphin health following the *Deepwater Horizon* oil spill (2013-2014), with evidence of persistent lung disease and impaired stress response. Endangered Species Research 33(1):127-142.

Smith TD, Allen J, Clapham PJ, Hammond PS, Katona S, Larsen F, Lien J, Mattila D, Palsbøll PJ, Sigurjónsson J, Stevick PT, Oien N. 1999. An ocean-basin-wide mark-recapture study of the North Atlantic humpback whale (*Megaptera novaeangliae*). Marine Mammal Science 15(1):1-32.

Smultea Sciences. 2020a. Protected species observer technical report for the Ørsted Sunrise Wind Farm, BOEM lease areas OCS-A 0487 and OCS-A 0500, offshore New York, 2019–2020. 195 p. Prepared for Ørsted. Boston, MA.

Smultea Sciences. 2020b. Protected species observer technical report for the Ørsted Sunrise Wind Farm, BOEM lease areas OCS-A 0487/0500, offshore Massachusetts and Rhode Island, 2019–2020. Final report. 93 p. Prepared for Ørsted. Boston, MA.

Southall BL. 2021. Evolutions in marine mammal noise exposure criteria. Acoustics Today 17(2): 52-60.

Southall BL, Ellison W, Clark CW, Tollit D, Amaral JL. 2021a. Marine mammal risk assessment for New England offshore windfarm construction and operational scenarios. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 104 p. Report No. OCS Study BOEM 2021-080.

Southall BL, Nowacek DP, Bowles AE, Senigaglia V, Bejder L, Tyack PL. 2021b. Marine mammal noise exposure criteria: Assessing the severity of marine mammal behavioral responses to human noise. Aquatic Mammals. 47(5):421-464. doi:10.1578/am.47.5.2021.421.

Stantec Consulting Services Inc. (Stantec). 2020. SFWF – Montauk O&M facility in-water work. Assessment of potential impacts to natural resources from in-water work. Prepared for Deepwater Wind South Fork, LLC by Stantec Consulting Services Inc. https://tethys.pnnl.gov/sites/default/files/publications/SFWF_COP_AppBB3.pdf.

Stantec Consulting Services Inc. (Stantec). 2022a. Offshore in-air acoustic assessment. Appendix I3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. November 2022.

Stantec Consulting Services Inc. (Stantec). 2022b. Marine mammals, sea turtles, and ESA-listed fish species assessment. Appendix O1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. August 2022.

Stantec Consulting Services Inc. (Stantec). 2022c. Air *t*raffic flow analysis/ADLA analysis. Appendix Y2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. August 2022.

Stevick PT, Allen J, Bérubé M, Clapham PJ, Katona SK, Larsen F, Lien J, Mattila DK, Palsbøll PJ, Sears R, Sigurjonsson J, Smith TD, Vikingsson G, Oien N, Hammond PS. 2003. Segregation of migration by feeding ground origin in North Atlantic humpback whales (*Megaptera novaeangliae*). Journal of Zoology, London 259:231-237.

Stone KM, Leiter SM, Kenney RD, Wikgren BC, Thompson JL, Taylor JKD, Kraus SD. 2017. Distribution and abundance of cetaceans in a wind energy development area offshore of Massachusetts and Rhode Island. Journal of Coastal Conservation 21(4):527-543.

Sullivan L, Brosnan T, Rowles T, Schwacke L, Simeone C, Collier TK. 2019. Guidelines for assessing exposure and impacts of oil spills on marine mammals. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 82 p. Report No.: NOAA Technical Memorandum NMFS-OPR-62.

Sunrise Wind LLC (Sunrise Wind). 2020. Emergency response plan/oil spill response plan – confidential. Appendix E1 in Construction and Operations Plan Sunrise Wind Farm. December 2020.

Sunrise Wind LLC (Sunrise Wind). 2022a. Petition for incidental take regulations for the construction and operation of the Sunrise Wind Offshore Wind Farm. Prepared for Sunrise Wind LLC by LGL Ecological Research Associates, Inc. Submitted to National Marine Fisheries Service, Office of Protected Resources. 187.

Sunrise Wind LLC (Sunrise Wind). 2022b. Safety management system - confidential. Appendix G1 in Construction and Operations Plan Sunrise Wind Farm. November 2022.

Sunrise Wind LLC (Sunrise Wind). 2022c. Draft protected species mitigation and monitoring plan. Appendix O2 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC. 2022d. Fisheries and benthic monitoring plan. Appendix AA1 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC. 2022e. Sunrise Wind benthic monitoring plan – New York State waters. Appendix AA2 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC (Sunrise Wind). 2023a. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sunrise Wind LLC (Sunrise Wind). 2023b. Reduced WTG foundation scenario – 87 foundations and updated marine mammal take estimates for the Sunrise Wind Offshore Wind Farm. Prepared for

Sunrise Wind LLC by LGL Ecological Research Associates, Inc. and JASCO Applied Science. Submitted to National Marine Fisheries Service, Office of Protected Resources. 16 p.

Takeshita R, Sullivan L, Smith C, Collier T, Hall A, Brosnan T, Rowles T, Schwacke L. 2017. The Deepwater Horizon oil spill marine mammal injury assessment. Endangered Species Research 33:95-106.

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: knowledge gaps, recommendations, and future directions. Renewable and Sustainable Energy Reviews 96:380-391.

Teilmann J, Carstensen J. 2012. Negative long term effects on harbour porpoises from a large scale offshore wine farm in the Baltic – evidence of slow recovery. Environmental Research Letters 7.

Testaverde SA, Mead JG. 1980. Southern distribution of the Atlantic whitesided dolphin, *Lagenorhynchus acutus*, in the western North Atlantic. Fishery Bulletin 78(1):167-169.

Tetra Tech and LGL. 2020. Final comprehensive report for New York Bight whale monitoring aerial surveys, March 2017 – February 2020. Technical report prepared by Tetra Tech, Inc. and LGL Ecological Research Associates, Inc. for New York State Department of Environmental Conservation.

Tetra Tech. 2022. Dominion Energy Coastal Virginia Offshore Wind Commercial Project: Request for rulemaking and Letter of Authorization (LOA) for taking of marine mammals incidental to construction activities on the Outer Continental Shelf (OCS) within lease OCS-A 0483 and the associated offshore export cable route corridor. Prepared for Dominion Energy by Tetra Tech, Inc. 313 p.

Thomsen F, Gill A, Kosecka M, Andersson M, Andre M, Degraer S, Folegot T, Gabriel J, Judd A, Neumann T, Norro A, Risch D, Sigray P, Wood D, Wilson B. 2015. MaRVEN – Environmental impacts of noise, vibrations and electromagnetic emissions from marine renewable energy. RTD-KI-NA-27-738-EN-N. Final study report prepared for European Commission, Directorate General for Research and Innovation.

Thorne LH, Foley HJ, Baird RW, Webster DL, Swaim ZT, Read AJ. 2017. Movement and foraging behavior of short-finned pilot whales in the Mid-Atlantic Bight: importance of bathymetric features and implications for management. Marine Ecology Progress Series 584:245-257.

Todd VLG, Todd IB, Gardiner JC, Morrin ECN, MacPherson NA, DiMarzio NA, Thomsen F. 2015. A review of impacts of marine dredging activities on marine mammals. ICES Journal of Marine Science 72(2):328–340.

Toth J, Evert S, Zimmermann E, Sullivan M, Dotts L, Able KW, Hagan R, Slocum C. 2018. Annual residency patterns and diet of *Phoca vitulina concolor* (Western Atlantic harbor seal) in a southern New Jersey estuary. Northeastern Naturalist 24(4):611–626.

Tougaard J, Henriksen OD, Miller LA. 2009. Underwater noise from three types of offshore wind turbines: estimation of impact zones for harbor porpoises and harbor seals. Journal of the Acoustical Society of America 125(6):3766-3773.

Tougaard J, Hermannsen L, Madsen PT. 2020. How loud is the underwater noise from operating offshore wind turbines? Journal of the Acoustical Society of America 148(5):2885–2893.

TRC. 2023. Ichthyoplankton entrainment assessment. Appendix N2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

Tyack PL, Miller EH. 2002. Vocal anatomy, acoustic communication and echolocation. Pages 142-184 in Hoelzel, R., ed. Marine mammal biology: An evolutionary approach. Bodmin, Cornwal: Blackwell Science, Ltd. Copyright Protected.

United States Environmental Protection Agency (USEPA). 2016. Climate change indicators: oceans. Available online: https://www.epa.gov/climate-indicators/oceans. Accessed: November 2021.

van Berkel J, Burchard H, Christensen A, Mortensen LO, Petersen OS, Thomsen F. 2020. The effects of offshore wind farms on hydrodynamics and implications for fishes. Oceanography 33:108-117.

van der Stap T, Coolen JWP, Lindeboom HJ. 2016. Marine fouling assemblages on offshore gas platforms in the southern North Sea: effects of depth and distance from shore on biodiversity. PLoS ONE 11(1):e0146324.

Van Parijs SM, Baker K, Carduner J, Daly J, Davis GE, Esch C, Guan S, Scholik-Schlomer A, Sisson NB, Staaterman E. 2021. NOAA and BOEM minimum recommendations for use of passive acoustic listening systems in offshore wind energy development monitoring and mitigation programs. Frontiers in Marine Science 8(1575).

Van Waerebeek K, Baker A, Felix F, Gedamke J, Iniguez M, Sanino GP, Secchi ED, Sutaria D, van Helden AN, Wang Y. 2007. Vessel collisions with small cetaceans worldwide and with large whales in the southern hemisphere, an initial assessment. LAJAM 6(1):43–49.

Vanderlaan ASM, Taggart CT. 2007. Vessel collisions with whales: The probability of lethal injury based on vessel speed. Marine Mammal Science 23(1):144-156.

Veirs S, Veirs V, Wood D. 2016. Ship noise extends to frequencies used for echolocation by endangered killer whales. PeerJ 4:c1657.

Wang JW, Yang SC. 2006. Unusual stranding events of Taiwan in 2004 and 2005. J. Cetacean Res. Manage 8(3):283–292.

Waring GT, Fairfield CP, Ruhsam CM, Sano M. 1993. Sperm whales associated with Gulf Stream features off the north-eastern U.S.A. shelf. Fisheries Oceanography 2(2):101-105.

Waring GT, Palka DL. 2002. North Atlantic marine mammals. 802-806 p.In: Perrin WF, Würsig B, Thewissen JGM (Eds). Encyclopedia of marine mammals. San Diego, California: Academic Press.

Weilgart LS. 2007. The impacts of anthropogenic ocean noise on cetaceans and implications for management. Canadian Journal of Zoology 85(11):1091-1116.

Weisbrod AV, Shea D, Moore MJ, Stegeman JJ. 2000. Bioaccumulation patterns of polychlorinated biphenyls and chlorinated pesticides in northwest Atlantic pilot whales. Environmental Toxicology and Chemistry: An International Journal 19(3):667-677.

Wells RS, Scott MD. 1997. Seasonal incidence of boat strikes on bottlenose dolphins near Sarasota, Florida. Marine Mammal Science 3:475–480.

Wenzel F, Mattila DK, Clapham PJ. 1988. *Balaenoptera musculus* in the Gulf of Maine. Marine Mammal Science 4(2):172-175.

Werner S, Budziak A, Franeker J, Galgani F, Hanke G, Maes T, Matiddi M, Nilsson P, Oosterbaan L, Priestland E, Thompson R, Veiga J, Vlachogianni T. 2016. Harm caused by marine litter. MSFD GES TG Marine Litter-Thematic Report. European Commission, Joint Research Centre. 91 p.

Whitehead H, Brennan S, Grover D. 1992. Distribution and behaviour of male sperm whales on the Scotian Shelf, Canada. Canadian Journal of Zoology 70:912-918.

Whitehead H, Moore MJ. 1982. Distribution and movements of West Indian humpback whales in winter. Canadian Journal of Zoology 60:2203-2211.

Whitehead H. 2003. Sperm whales: social evolution in the ocean. 431 p. Chicago, Illinois: University of Chicago Press.

Whitt AD, Dudzinski K, Laliberté JR. 2013. North Atlantic right whale distribution and seasonal occurrence in nearshore waters off New Jersey, U.S.A., and implications for management. Endangered Species Research 20:50-69.

Wiley DN, Wenzel FW, Young SB. 1994. Extralimital residency of bottlenose dolphins in the western North Atlantic. Marine Mammal Science 10(2):223-226.

Wilhelmsson D, Malm T, Ohman MC. 2006. The influence of offshore windpower on demersal fish. ICES Journal of Marine Science 63:775-784.

Winn HE, Price CA, Sorensen PW. 1986. The distributional biology of the right whale (*Eubalaena glacialis*) in the western North Atlantic. Reports of the International Whaling Commission (Special Issue 10):129-138.

Wood J, Southall BL, Tollit DJ. 2012. PG&E offshore 3-D seismic survey project EIR – Marine mammal technical draft report. SMRU Ltd.: SMRU Ltd.

Wood SA, Murray KT, Josephson E, Gilbert J. 2020. Rates of increase in gray seal (*Halichoerus grypus atlantica*) pupping at recolonized sites in the United States, 1988-2019. Journal of Mammalogy 101(1):121-128.

Woods Hole Group. 2022. Sediment transport modeling report. Appendix H in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC. August 2022.

Würsig B, Greene Jr. CR, Jefferson TA. 2000. Development of an air bubble curtain to reduce underwater noise of percussive piling. Marine Environmental Research. 49:79-93.

Zeh JM, Rekdahl ML, Rice AN, Clark CW, Rosenbaum HC. 2021. Detections of humpback whale (*Megaptera novaeangliae*) vocalizations on an acoustic sensor in the New York Bight. Marine Mammal Science 37(2):751-760.

Zoidis AM, Lomac-MacNair KS, Ireland DS, Rickard ME, McKown KA, Schlesinger MD. 2021. Distribution and density of six large whale species in the New York Bight from monthly aerial surveys 2017 to 2020. Continental Shelf Research 230:104572.

Zoidis AM, Olson PA, Jefferson TA, Johnson NC, Soucier CP, Bassi JH. 2022. Distribution and abundance of marine mammals in the estuarine waters of the Piscataqua River, Maine, U.S.A. Aquatic Mammals 48(1):25-35.

Zoodsma B, Howe K, White M, Jakush J, George C, Gowan T, Hamilton P, Jackson K, Pitchford T, Taylor C, Ward L. 2016. North Atlantic right whale calving area surveys: 2014/2015 results. U.S. Dept. of Commerce, NOAA. 10 p. Report No.: NOAA Technical Memorandum NMFSSER-4.

K.3.10. Section 3.12 – Sea Turtles

Bailey H, Brookes KL, Thompson PM. 2014. Assessing environmental impacts of offshore wind farms: Lessons learned and recommendations for the future. Aquatic Biosystems 10(1):1-13.

Barnette MC. 2017. Potential impacts of artificial reef development on sea turtle conservation in Florida. St. Petersburg (FL): U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office. 34 p. Report No.: NOAA Technical Memorandum NMFS-SER-5.

Barreiros JP, Raykov VS. 2014. Lethal lesions and amputation caused by plastic debris and fishing gear on the loggerhead turtle *Caretta caretta* (Linnaeus, 1758). Three case reports from Terceira Island, Azores (NE Atlantic). Mar Pollut Bull 86(1-2):518-522.

Bartol IK, Bartol SM. 2011. Hearing capabilities of loggerhead sea turtles (*Caretta caretta*) throughout ontogeny: an integrative approach involving behavioral and electrophysiological techniques. London (UK): Joint Industry Program. Adv Exp Med Biol 2012(730):89-92.

Bartol SM, Ketten DR. 2006. Turtle and tuna hearing. In: Swimmer Y, Brill R (Eds). Sea turtle and pelagic fish sensory biology: Developing techniques to reduce sea turtle bycatch in longline fisheries NOAA Technical Memorandum NMFS-PIFSC-7; p. 98-103.

Bartol SM, Musick JA, Lenhardt ML. 1999. Auditory evoked potentials of the loggerhead sea turtle (*Caretta caretta*). Copeia 1999(3):836-840.

Bembenek-Bailey SA, Niemuth JN, McClellan-Green PD, Godfrey MH, Harms CA, Gracz H, Stoskopf MK. 2019. NMR metabolomic analysis of skeletal muscle, heart, and liver of hatchling loggerhead sea turtles (*Caretta caretta*) experimentally exposed to crude oil and/or Corexit. Metabolites 9(2).

Bevan E, Whiting S, Tucker T, Guinea M, Raith A, Douglas R. 2018. Measuring behavioral responses of sea turtles, saltwater crocodiles, and crested terns to drone disturbance to define ethical operating thresholds. PLoS ONE 13(3):e0194460.

Blackstock SA, Fayton JO, Hulton PH, Moll TE, Jenkins K, Kotecki S, Henderson E, Bowman V, Rider S, Martin C. 2018. Quantifying acoustic impacts on marine mammals and sea turtles: methods and analytical approach for phase III training and testing. NUWC-NPT Technical Report. Newport (RI): Naval Undersea Warfare Center Division. 51 p.

Boettcher R. 2015. Personal communication via email between Ms. Ruth Boettcher, Virginia Department of Game and Inland Fisheries, and Ms. Amy Whitt, Azura Consulting LLC, 6 March.

Bonacci-Sullivan L. 2018. Summary report of the New York Bight sea turtle workshop. East Setauket, NY: New York State Department of Environmental Conservation. https://www.dec.ny.gov/docs/fish_marine_pdf/dmrturtlereport.pdf.

Brazner JC, McMillan J. 2008. Loggerhead turtle (*Caretta caretta*) bycatch in Canadian pelagic longline fisheries: Relative importance in the western North Atlantic and opportunities for mitigation. Fisheries Research 91:310-324.

Brown D, Sutherland LC. 1980. Correction procedures for aircraft noise data, Vol. 5: propeller aircraft noise. Prepared by Wyle Laboratories for the U.S. Department of Transportation, Federal Aviation Administration. https://www.tc.faa.gov/its/worldpac/techrpt/ee80-1-1.pdf.

Bugoni L, Kraus L, Petry MV. 2001. Marine debris and human impacts on sea turtles in southern Brazil. Marine Pollution Bulletin 42(12):1330-1334.

Bureau of Ocean Energy Management (BOEM). 2013. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Rhode Island and Massachusetts. Revised environmental assessment. Herndon, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 417 p. Report No. OCS EIA/EA BOEM 2013-1131.

Bureau of Ocean Energy Management (BOEM). 2017. Gulf of Mexico OCS oil and gas lease sales: 2017-2022. Gulf of Mexico lease sales 249, 250, 251, 252, 253, 254, 256, 257, 259, and 261. Final multiscale environmental impact statement. New Orleans, LA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region. 368 p. Report No.: BOEM 2017-009.

Bureau of Ocean Energy Management (BOEM). 2019a. Draft proposed guidelines for providing information on lighting and marking of structures supporting renewable energy development. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 9 p.

Bureau of Ocean Energy Management (BOEM). 2019b. National Environmental Policy Act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic continental shelf. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 213 p. Report No.: 2019-036.

Bureau of Ocean Energy Management (BOEM). 2019c. Guidelines for providing information on fisheries for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR Part 585. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 9 p.

Bureau of Ocean Energy Management (BOEM). 2021. South Fork Wind Farm and South Fork Export Cable Project biological assessment for the National Marine Fisheries Service. Sterling. VA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs.

Burke VJ, Morreale SJ, Standora EA. 1994. Diet of the Kemp's ridley sea turtle, *Lepidochelys kempii*, in New York waters. Fishery Bulletin 92(1):26-32.

Burke VJ, Standora EA, Morreale SJ. 1991. Factors affecting strandings of cold-stunned juvenile Kemp's ridley and loggerhead sea turtles in Long Island, New York. Copeia 1991(4):1136-1138.

Ceriani SA, Roth JD, Sasso CR, McClellan CM, James MC, Haas HL, Smolowitz RJ, Evans DR, Addison DS, Bagley DA, Ehrhart LM, Weishampel JF. 2014. Modeling and mapping isotopic patterns in the Northwest Atlantic derived from loggerhead sea turtles. Ecosphere 5(9):122.

Cetacean and Turtle Assessment Program (CETAP). 1982. Characterization of marine mammals and turtles in the Mid- and North Atlantic areas of the U.S. outer continental shelf - final report of the cetacean and turtle assessment program. Prepared for U.S. Bureau of Land Management, Washington, D.C. by Cetacean and Turtle Assessment Program, University of Rhode Island, Graduate School of Oceanography, Kingston, Rhode Island.

Conn PB, Silber GK. 2013. Vessel speed restrictions reduce risk of collision-related mortality for North Atlantic right whales. Ecosphere 4(4):43.

Coyne MS, Monaco ME, Landry AM, Jr. 2000. Kemp's ridley habitat suitability index model. In: Abreu-Grobois FA, Briseño-Dueñas R, Márquez-Millán R, Sarti-Martínez L (eds). Proceedings of the Eighteenth International Sea Turtle Symposium: NOAA Technical Memorandum NMFS-SEFSC-436. 60 p.

Department of the Navy (DoN). 2005. Marine resources assessment for the Northeast operating areas: Atlantic City, Narragansett Bay, and Boston. Norfolk, Virginia: Department of the Navy, U.S. Fleet Forces Command.

Department of the Navy (DoN). 2008a. Marine resources assessment update for the Cherry Point operating area. Prepared for Naval Facilities Engineering Command, Atlantic, Norfolk, Virginia by Geo-Marine, Inc. Hampton, Virginia.

Department of the Navy (DoN). 2008b. Marine resources assessment update for the Virginia Capes (VACAPES) operating area. Prepared for Naval Facilities Engineering Command, Atlantic, Norfolk, Virginia by Geo-Marine, Inc. Hampton, Virginia.

Department of the Navy (DoN). 2017. Criteria and thresholds for U.S. Navy acoustic and explosive effects analysis (Phase III). Technical report. U.S. Department of the Navy, Space and Naval Warfare Systems Center Pacific.

Department of the Navy (DoN). 2018. Final environmental impact statement/overseas environmental impact statement. Hawaii-Southern California training and testing. United States Department of the Navy. 854 p.

DeRuiter SL, Doukara KL. 2012. Loggerhead turtles dive in response to airgun sound exposure. Endangered Species Research 16:55-63.

Diez CE, Vélez-Zuazo X, Van Dam RP. 2003. Hawksbill turtles in seagrass beds. Marine Turtle Newsletter 102:8-10.

Dodge KL, Galuardi B, Miller TJ, Lutcavage ME. 2014. Leatherback turtle movements, dive behavior, and habitat characteristics in ecoregions of the Northwest Atlantic Ocean. PloS ONE 9(3):e91726.

Dow Piniak WE, Eckert SA, Harms CA, Stringer EM. 2012. Underwater hearing sensitivity of the leatherback sea turtle (*Dermochelys coriacea*): Assessing the potential effect of anthropogenic noise. Herndon, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management.

DNV-GL. 2022. Navigation safety risk assessment. Appendix X in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Duncan EM, Botterell ZL, Broderick AC, Galloway TS, Lindeque PK, Nuno A, Godley BJ. 2017. A global review of marine turtle entanglement in anthropogenic debris: a baseline for further action. Endangered Species Research 34:431–448.

Elliott J, Smith K, Gallien DR, Khan A. 2017. Observing cable laying and particle settlement during the construction of the Block Island Wind Farm. Final report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 225 p. Report No. BOEM 2017-027.

Elliott BW, Read A, Godley B, Nelms S, Nowacek D. 2019. Critical information gaps remain in understanding impacts of industrial seismic surveys on marine vertebrates. Endangered Species Research 39.

Epperly S, Avens L, Garrison L, Henwood T, Hoggard W, Mitchell J, Nance J, Poffenberger J, Sasso C, Scott-Denton E, Yeung S. 2002. Analysis of sea turtle bycatch in the commercial shrimp fisheries of southeast U.S. waters and the Gulf of Mexico. NOAA Technical Memorandum NMFS-SEFSC 490:1-88.

Epperly SP, Braun J, Chester AJ, Cross FA, Merriner JV, Tester PA. 1995. Winter distribution of sea turtles in the vicinity of Cape Hatteras and their interactions with the summer flounder trawl fishery. Bulletin of Marine Science 56:547-568.

Exponent Engineering P.C. 2022. Offshore DC and AC electric-and magnetic field assessment. Appendix J1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Finkbeiner EM, Wallace BP, Moore EJ, Lewison RL, Crowder LB, Read AJ. 2011. Cumulative estimates of sea turtle bycatch and mortality in U.S.A. fisheries between 1990 and 2007. Biological Conservation 144(11):2719–2727.

Foote JJ, Mueller TL. 2002. Two Kemp's ridley (*Lepidochelys kempii*) nests on the central Gulf coast of Sarasota County Florida (U.S.A.). 252-253 p. In: Mosier A, Foley A, Brost B (Eds). Proceedings of the Twentieth Annual Symposium on Sea Turtle Biology and Conservation: NOAA Technical Memorandum NMFS-SEFSC-477.

Gall SC, Thompson RC. 2015. The impact of debris on marine life. Marine Pollution Bulletin 92(1):170-179.

Gallaway BJ. 1981. An ecosystem analysis of oil and gas development on the Texas-Louisiana Continental Shelf. U.S. Fish and Wildlife Service. [accessed 2022 Jun 09]. http://pubs.er.usgs.gov/publication/fwsobs81_27.

Gardline. 2021a. Protected species observer interim report for the Sunrise Wind Offshore Wind Farm 2020 and 2021 geotechnical survey. Norfolk (England). 83 p.

Gardline. 2021b. Protected species observer technical summary report for the Sunrise Wind Offshore Wind Farm geophysical survey 2019-2020. Norfolk (England). 75 p.

Gitschlag GR, Herczeg BA. 1994. Sea turtle observations at explosive removals of energy structures. Marine Fisheries Review 56(2):1-8.

Gless JM, Salmon M, Wyneken J. 2008. Behavioral responses of juvenile leatherbacks *Dermochelys coriacea* to lights used in the longline fishery. Endangered Species Research 5(2-3):239-247.

Godfrey D. 1996. Divine intervention? Kemp's ridley nests on Volusia County Beach. Caribbean Conservation Corporation Newsletter (Summer):1-2.

Greater Atlantic Regional Fisheries Office (GARFO). 2020. Guidance for carrying out Endangered Species Act (ESA) Section 7 consultations with NOAA Fisheries Greater Atlantic Regional Fisheries Office. NOAA Fisheries, Greater Atlantic Regional Fisheries Office. [accessed 2022 Jun 09]. https://media.fisheries.noaa.gov/dammigration/garfo_esa_section_7_technical_guidance_1312020_508.pdf.

Greater Atlantic Regional Fisheries Office (GARFO). 2021a. GARFO Acoustics Tool: Analyzing the effects of pile driving on ESA-listed species in the Greater Atlantic Region. NOAA Fisheries, Greater Atlantic Regional Fisheries Office. [accessed 2022 Jun 09].

https://s3.amazonaws.com/media.fisheries. noaa.gov/2020-09/GARFO-Sect7-PileDriving-AcousticsTool-09142020.xlsx?.Egxagq5Dh4dpIw JQsmN1gV0nggnk5qX.

Greater Atlantic Regional Fisheries Office (GARFO). 2021b. Section 7 species presence table: sea turtles in the Greater Atlantic Region. [updated 2021 Jan 13; accessed 2022 Jun 09]. https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-presence-table-sea-turtles-greater.

Gregory MR. 2009. Environmental implications of plastic debris in marine settings–entanglement, ingestion, smothering, hangers-on, hitch-hiking and alien invasions. Philos Trans R Soc Lond B Biol Sci 364(1526):2013-2025.

Griffin D, Murphy S, Frick M, Broderick A, Coker J, Coyne M, Dodd M, Godfrey M, Godley B, Hawkes L, Murphy T, Willimas K, Witt J. 2013. Foraging habitats and migration corridors utilized by a recovering subpopulation of adult female loggerhead sea turtles: Implications for conservation. Marine Biology 160(12):3071-3086.

Hamann M, Godfrey MH, Seminoff JA, Arthur K, Barata PCR, Bjorndal KA, Bolten AB, Broderick AC, Campbell LM, Carreras C, Casale P, Chaloupka M, Chan SK, Coyne M, Crowder LB, Diez CE, Dutton PH, Epperly SP, FitzSimmons NN, Formia A, Girondot M, Hays GC, Cheng IJ, Kaska Y, Lewison R, Mortimer JA, Nichols WJ, Reina RD, Shanker K, Spotila JR, Tomás J, Wallace BP, Work TM, Zbiden N, Godley BJ. 2010. Global research priorities for sea turtles: Informing management and conservation in the 21st century. Endangered Species Research 11(3):245-269.

Hare JA, Morrison WE, Nelson MW, Stachura MM, Teeters EJ, Griffis RB, Griswold CA. 2016. A vulnerability assessment of fish and invertebrates to climate change on the Northeast continental shelf. PLoS One 11(2):30.

Hatch L, Clark C, Merrick R, Parijs S, Ponirakis D, Schwehr K, Thompson M, Wiley D. 2008. Characterizing the relative contributions of large vessels to total ocean noise fields: A case study using the Gerry E. Studds Stellwagen Bank Nation Marine Sanctuary. Environmental Management 42(5):735-752.

Hawkes LA, Broderick AC, Godfrey MH, Godley BJ. 2009. Climate change and marine turtles. Endangered Species Research 7:137-154.

Hawkes LA, Witt MJ, Broderick AC, Coker JW, Coyne MS, Dodd M, Frick MG, Godfrey MH, Griffin DB, Murphy SR, Murphy TM, Williams KL, Godley BJ. 2011. Home on the range: Spatial ecology of loggerhead turtles in Atlantic waters of the U.S.A. Diversity and Distributions 17(4):624-640.

Hazel J, Lawler IR, Marsh H, Robson S. 2007. Vessel speed increases collision risk for the green turtle Chelonia mydas. Endangered Species Research 3:105–113.

Henwood TA, Stuntz WE. 1987. Analysis of sea turtle captures and mortalities during commercial shrimp trawling. Fishery Bulletin 85(4):813-817.

Hoarau L, Ainley L, Jean C, Ciccione S. 2014. Ingestion and defecation of marine debris by loggerhead sea turtles, *Caretta caretta*, from by-catches in the south-west Indian Ocean. Marine Pollution Bulletin 84(1-2):90-96.

Jean C, Ciccione S, Ballorain K, Georges J-Y, Bourjea J. 2010. Ultralight aircraft surveys reveal marine turtle population increases along the west coast of Reunion Island. Oryx 44(2):223-229.

Keinath JA, Musick JA, Swingle WM. 1991. First verified record of the hawksbill sea turtle (*Eretmochelys imbricata*) in Virginia waters. Catesbeiana 11(2):35-38.

Kenney RD, Vigness-Raposa KJ. 2010. Technical report 10. Marine mammals and sea turtles of Narragansett Bay, Block Island Sound, Rhode Island Sound, and nearby waters: An analysis of existing data for the Rhode Island Ocean Special Area Management Plan. Wakefield, Rhode Island: Rhode Island Coastal Resources Management Council. Appendix A, 634-970 p.

Ketten DR, Moein Bartol S. 2006. Functional measures of sea turtle hearing. ONR Award Number N00014-02-1-0510. Prepared for the Office of Naval Research, Boston, Massachusetts by Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.

Kite-Powell H, Knowlton A, Brown M. 2007. Modeling the effect of vessel speed on right whale ship strike risk. Prepared for NOAA/NMFS Project NA04NMF47202394. Woods Hole, Massachusetts: Woods Hole Oceanographic Institute.

Kraus SD, Kenney RD, Thomas L. 2019. A framework for studying the effects of offshore wind development on marine mammals and turtles. Prepared for the Massachusetts Clean Energy Center and the Bureau of Ocean Energy Management by the Anderson Cabot Center for Ocean Life and the Centre for Research into Ecological and Environmental Modelling. 48 p.

Kraus SD, Leiter S, Stone K, Wikgren B, Mayo C, Hughes P, Kenney RD, Clark CW, Rice AN, Estabrook B, Tielens J. 2016. Northeast Large Pelagic Survey Collaborative Aerial and Acoustic Surveys for Large Whales and Sea Turtles. OCS Study BOEM 2016-054. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management.

Kraus SD, Taylor JKD, Wikgren B, Kenney RD, Mayo C, Ganley L, Hughes P, Clark CW, Rice AN. 2013. Field surveys of whales and sea turtles for offshore wind planning in Massachusetts 2011-2012.

Küsel ET, Weirathmueller MJ, Koessler MW, Zammit KE, Quijano JE, Kanu C, Limpert KE, Clapsaddle ME, Zeddies DG. 2022. Underwater noise and exposure modeling. Appendix I1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. April 2022.

Laist DW, Knowlton AR, Mead JG, Collet AS, Podesta M. 2001. Collisions between ships and whales. Marine Mammal Science 17(1):35–75.

Landry AM, Jr., Costa D. 1999. Status of sea turtle stocks in the Gulf of Mexico with emphasis on the Kemp's ridley. 248-268 p. In: Kumpf H, Steidinger K, Sherman K (Eds). The Gulf of Mexico large marine ecosystem: Assessment, sustainability, and management. Malden, Massachusetts: Blackwell Science.

Langhamer O. 2012. Artificial reef effect in relation to offshore renewable energy conversion: state of the art. The Scientific World Journal 2012:8.

Lavender AL, Bartol SM, Bartol IK. 2014. Ontogenetic investigation of underwater hearing capabilities in loggerhead sea turtles (*Caretta caretta*) using a dual testing approach. Journal of Experimental Biology 217:2580–2589.

Lazell JD, Jr. 1980. New England waters: Critical habitat for marine turtles. Copeia 1980(2):290-295.

Lee DS, Palmer WM. 1981. Records of leatherback turtles, *Dermochelys coriacea* (*Linnaeus*), and other marine turtles in North Carolina waters. Brimleyan 5:95-106.

LGL Ecological Research Associates, Inc (LGL Ecological Research Associates). 2022. Protected species mitigation and monitoring plan: sea turtles and ESA-listed fish species. Appendix O3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. July 2022.

Limpus CJ. 2006. Marine turtle conservation and Gorgon gas development, Barrow Island, western Australia. In Gorgon Gas Development Barrow Island Nature Reserve, Chevron Australia. Perth, Western Australia: Environmental Protection Agency (Western Australia). 20 p. https://www.epa.wa.gov.au/sites/default/files/Proponent_response_to_submissions/A1496_R1221_ERMP_RTS_Appendix%2012.%20Limpus%20Report%20Final.pdf.

Liu X, Manning J, Prescott R, Page F, Zou H, Faherty M. 2019. On simulating cold-stunned sea turtle strandings on Cape Cod, Massachusetts. PloS ONE 14(12):e0204717.

Lutcavage M, Musick JA. 1985. Aspects of the biology of sea turtles in Virginia. Copeia 1985(2):449-456.

Lutcavage ME, Lutz PL. 1997. Diving physiology. Pages 277-296 in Lutz PL, Musick JA (Eds). The biology of sea turtles. Boca Raton, Florida: CRC Press.

Lutcavage ME, Plotkin P, Witherington B, Lutz PL. 1997. Human impacts on sea turtle survival. 387-409 p. In: Lutz PL, Musick JA, editors. The biology of sea turtles. Boca Raton, Florida: CRC Press.

Manzella S, Wouldiams J, Schroeder B, Teas W. 1991. Juvenile head-started Kemp's ridleys found in floating grass mats. Marine Turtle Newsletter 52:5-6.

Martin KJ, Alessi SC, Gaspard JC, Tucker AD, Bauer GB, Mann DA. 2012. Underwater hearing in the loggerhead turtle (*Caretta caretta*): A comparison of behavioral and auditory evoked potential audiograms. The Journal of Experimental Biology 215(17):3001-3009.

McCauley RD, Fewtrell J, Duncan AJ, Jenner C, Jenner M-N, Penrose JD, Prince RIT, Adhitya A, Murdoch J, McCabe K. 2000. Marine seismic surveys: Analysis and propagation of air-gun signals; and effects of air-gun exposure on humpback whales, sea turtles, fishes and squid. Bentley, Australia: Curtin University of Technology, Centre for Marine Science and Technology. https://www.pge.com/includes/docs/pdfs/shared/edusafety/systemworks/dcpp/mcCauley_et_al_2000_marine_seismic_surveys_a_study_of_environmental_implications.pdf

McMahon CR, Hays GC. 2006. Thermal niche, large-scale movements and implications of climate change for a critically endangered marine vertebrate. Global Change Biology 12:1-9.

Meylan A, Castaneda P, Coogan C, Lozon T, Fletemeyer J. 1990. First recorded nesting by Kemp's ridley in Florida, U.S.A. Marine Turtle Newsletter 48:8-9.

Michel J, Bejarano AC, Peterson CH, Voss C. 2013. Review of biological and biophysical impacts from dredging and handling of offshore sand. OCS Study BOEM 2013-0119. Herndon, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management.

Miller JH, Potty GR. 2017. Measurements of underwater sound radiated from an offshore wind turbine. The Journal of the Acoustical Society of America 142(4):2699.

Mitchell GH, Kenney RD, Farak AM, Campbell RJ. 2002. Evaluation of occurrence of endangered and threatened marine species in Naval ship trial areas and transit lanes in the Gulf of Maine and offshore of Georges Bank. Newport, Rhode Island: Naval Undersea Warfare Division.

Mitchelmore CL, Bishop CA, Collier TK. 2017. Toxicological estimation of mortality of oceanic sea turtles oiled during the *Deepwater Horizon* oil spill. Endangered Species Research 33:39-50.

Morreale SJ, Meylan AB, Sadove SS, Standora EA. 1992. Annual occurrence and winter mortality of marine turtles in New York waters. Journal of Herpetology 26:301-308.

Morreale SJ, Standora EA. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. Chelonian Conservation and Biology 4(4):872-882.

Mrosovsky N. 1980. Thermal biology of sea turtles. American Zoologist 20(3):531-547.

Murray KT. 2011. Interactions between sea turtles and dredge gear in the U.S. sea scallop (*Placopecten magellanicus*) fishery, 2001–2008. Fisheries Research 107(1-3):137-146.

National Marine Fisheries Service (NMFS). 1995. Sea turtle conservation; restrictions applicable to shrimp trawl activities; leatherback conservation zone. Federal Register. P. 47713-47715.

National Marine Fisheries Service (NMFS). 2000. Sea turtle conservation; restrictions applicable to shrimp trawl activities; leatherback conservation zone–temporary rule. Federal Register. P. 33779-33780.

National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Secretariat of Environment and Natural Resources (NMFS). 2011. Bi-National recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*). Second revision. Silver Spring, Maryland: National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Secretariat of Environment and Natural Resources.

National Marine Fisheries Service (NMFS). 2014. Endangered Species Act Section 7 consultation biological opinion: Continued operation of Salem and Hope Creek Nuclear Generating Stations NER-2010-6581. NOAA, National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office.

National Marine Fisheries Service (NMFS). 2016a. Final programmatic environmental assessment for fisheries research conducted and funded by the Northeast Fisheries Science Center. Prepared for Northeast Fisheries Science Center, National Marine Fisheries Service by URS Group.

National Marine Fisheries Service (NMFS). 2021. Data collection and site survey activities for renewable energy on the Atlantic Outer Continental Shelf. Greater Atlantic Regional Fisheries Office, Office of Protected Resources. Section 7 consultation GARFO-2021-00999.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 1991a. Recovery plan for U.S. population of Atlantic green turtle. Washington, D.C.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 1991b. Recovery plan for U.S. population of loggerhead turtle. Washington, D.C.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. Washington, D.C.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 1993. Recovery plan for hawksbill turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico. St. Petersburg, Florida.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2007. Loggerhead sea turtle (*Caretta caretta*). 5-year review: Summary and evaluation.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2008. Recovery plan for the Northwest Atlantic population of the loggerhead sea turtle (*Caretta caretta*) - Second revision. Silver Spring, Maryland.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2013a. Hawksbill sea turtle (*Eretmochelys imbricata*). 5-year review: Summary and evaluation. Prepared by National Marine Fisheries Service, Silver Spring, Maryland and U.S. Fish and Wildlife Service, Jacksonville, Florida.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2013b. Leatherback sea turtle (*Dermochelys coriacea*) 5-year review: Summary and evaluation. Silver Spring, Maryland and Jacksonville, Florida.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2015. Kemp's ridley sea turtle (*Lepidochelys kempii*). 5-year review: summary and evaluation. National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD and U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM. 63 p.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2016. Endangered and threatened wildlife and plants; Final rule to list eleven distinct population segments of the green sea turtle (*Chelonia mydas*) as endangered or threatened and revision of current listings under the Endangered Species Act. Federal Register. 81(66):20058-20090.

National Marine Fisheries Service and U.S. Fish and Wildlife Service (NMFS and USFWS). 2020. Endangered Species Act status review of the leatherback turtle (*Dermochelys coriacea*). Report to the National Marine Fisheries Service Office of Protected Resources and U.S. Fish and Wildlife Service. 396 p.

National Marine Fisheries Service Sea Turtle Stranding and Salvage Network Reports (NMFS STSSN). 2022. Sea turtle stranding and salvage network reports. [accessed 2022 Jun 10]. https://grunt.sefsc.noaa.gov/stssnrep/.

National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Secretaría de Medio Ambiente y Recursos Naturales (NMFS U, and SEMARNAT). 2011a. Bi-national recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*): Second revision. Silver Spring, Maryland.

National Marine Fisheries Service, U.S. Fish and Wildlife Service, and Secretariat of Environment and Natural Resources (NMFS U, and SENR). 2011b. Bi-national recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*). Second revision. Silver Spring, Maryland.

National Oceanic and Atmospheric Administration (NOAA). 2022. Section 7 effect analysis: turbidity in the Greater Atlantic Region. National Oceanic and Atmospheric Administration, U.S. Department of Commerce. [accessed 2022 Feb 15]. https://www.fisheries.noaa.gov/ new-england-mid-atlantic/consultations/section-7-effect-analysis-turbidity-greater-atlantic-region.

National Research Council. 1990. Decline of the sea turtles: causes and prevention. Washington, D.C.: National Academy Press.

National Research Council. 1996. An assessment of techniques for removing offshore structures. Washington (DC): The National Academies Press. 86 p. [accessed 2022 Jun 10]. https://www.nap.edu/catalog/9072/an-assessment-of-techniques-for-removing-offshore-structures.

National Science Foundation and U.S. Geological Survey (NSF and USGS). 2011. Final programmatic environmental impact statement/overseas environmental impact statement for marine seismic research. National Science Foundation, Arlington (VA) and U.S. Geological Survey, Reston (VA). 514 p.

Nelms SE, Duncan EM, Broderick AC, Galloway TS, Godfrey MH, Hamann M, Lindeque PK, Godley BJ. 2016. Plastic and marine turtles: a review and call for research. ICES Journal of Marine Science 73(2):165-181.

New York Marine Rescue Center. 2022. Research: sea turtle strandings by species 1980 through 2018. New York Marine Rescue Center. [accessed 2022 Jun 10]. http://nymarinerescue.org/what-we-do/?doing_wp_cron=162007.

New York State Energy Research and Development Authority (NYSERDA). 2020. Digital aerial baseline survey of marine wildlife in support of offshore wind energy. Third annual report: Summer 2016–Spring 2019, Sixth interim report. Prepared for New York State Energy Research and Development Authority by Normandeau Associates Inc. with APEM Ltd.

Normandeau Associates, Inc. (Normandeau), Exponent Inc., Tricas T, Gill A. 2011. Effects of EMFs from undersea power cables on elasmobranchs and other marine species. Camarillo, (CA): U.S. Department of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region. O'Hara J, Wilcox JR. 1990. Avoidance responses of loggerhead turtles, *Caretta caretta*, to low frequency sound. Copeia 1990(2):564-567.

Northeast Fisheries Science Center and Southeast Fisheries Science Center (NEFSC and SEFSC). 2018. 2017 annual report of a comprehensive assessment of marine mammal, marine turtle, and seabird abundance and spatial distribution in U.S. waters of the western North Atlantic Ocean – AMAPPS II. https://repository.library.noaa.gov/view/noaa/22419.

Northeast Fisheries Science Center and Southeast Fisheries Science Center (NEFSC and SEFSC). 2020. 2019 annual report of a comprehensive assessment of marine mammal, marine turtle, and seabird abundance and spatial distribution in U.S. waters of the western North Atlantic Ocean – AMAPPS II. https://repository.library.noaa.gov/view/noaa/26467.

Northeast Fisheries Science Center and Southeast Fisheries Science Center (NEFSC and SEFSC). 2021. 2020 Annual report of a comprehensive assessment of marine mammal, marine turtle, and seabird abundance and spatial distribution in U.S. waters of the Western North Atlantic Ocean: AMAPPS III. (U.S.). *https://repository.library.noaa.gov/view/noaa/29491.*

O'Brien O, McKenna K, Hodge B, Pendleton D, Baumgartner M, Redfern J. 2021a. Megafauna aerial surveys in the Wind Energy Areas of Massachusetts and Rhode Island with emphasis on large whales. Summary Report – Campaign 5, 2018-2019. U.S. Department of the Interior, Bureau of Ocean Energy Management.

O'Brien O, McKenna K, Pendleton D, Redfern J. 2021b. Megafauna aerial surveys in the wind energy areas of Massachusetts and Rhode Island with emphasis on large whales: Interim Report Campaign 6A, 2020. U.S. Department of the Interior, Bureau of Ocean Energy Management.

O'Hara J, Wilcox JR. 1990. Responses of loggerhead sea turtles, *Caretta caretta*, to low frequency sound. Copeia 199:564–567.

Orr TL, Herz SM, Oakley DL. 2013. Evaluation of lighting schemes for offshore wind facilities and impacts to local environments. OCS study, BOEM 2013-0116. Prepared for U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Herndon, Virginia by ESS Group Inc., East Providence, Rhode Island.

Osgood KE, ed. 2008. Climate impacts on U.S. living marine resources: National Marine Fisheries Service concerns, activities and needs. NOAA Technical Memorandum NMFS-F/SPO-89. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Fisheries Science Center.

Palka DL, Chavez-Rosales S, Josephson E, Cholewiak D, Haas HL, Garrison L, Jones M, Sigourney D, Waring G, Jech M, Broughton E, Soldevilla M, Davis G, DeAngelis A, Sasso CR, Winton MV, Smolowitz RJ, Fay G, LaBrecque E, Leiness JB, Dettloff, Warden M, Murray K, Orphanides C. 2017a. Atlantic Marine Assessment Program for Protected Species: 2010-2014. Washington, DC:

U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region. 211 p. Report No.: OCS Study BOEM 2017-071.

Palka DL, Chavez-Rosales S, Josephson E, Cholewiak D, Haas HL, Garrison L, Jones M, Sigourney D, Waring G, Jech M, Broughton E, Soldevilla M, Davis G, DeAngelis A, Sasso CR, Winton MV, Smolowitz RJ, Fay G, LaBrecque E, Leiness JB, Dettloff, Warden M, Murray K, Orphanides C. 2017b. Atlantic Marine Assessment Program for Protected Species: 2010-2014. Appendix II – Appendix V. Washington, DC: U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region. 128 p. Report No.: Supplement to Final Report BOEM 2017-071.

Pangerc T, Robinson S, Theobald P, Galley L. 2016. Underwater sound measurement data during diamond wire cutting: First description of radiated noise. In: Proceedings of the Fourth International Conference on the Effects of Noise on Aquatic Life July 10–16 Dublin, Ireland.

Parker LG. 1995. Encounter with a juvenile hawksbill turtle offshore Sapelo Island, Georgia. Marine Turtle Newsletter 71:19-22.

Patel SH, Winton MV, Hatch JM, Haas HL, Saba VS, Fay G, Smolowitz RJ. 2021. Projected shifts in loggerhead sea turtle thermal habitat in the Northwest Atlantic Ocean due to climate change. Scientific Reports 11:8850.

Peterson C, Monahan G, Schwartz F. 1985. Tagged green turtle returns and nests again in North Carolina. Marine Turtle Newsletter 35:5-6.

Piniak WED, Mann DA, Harms CA, Jones TT, Eckert SA. 2016. Hearing in the juvenile green sea turtle (*Chelonia mydas*): A comparison of underwater and aerial hearing using auditory evoked potentials. PloS ONE 11(10):e0159711.

Plotkin PT, editor 1995. National Marine Fisheries Service and U.S. Fish and Wildlife Service status reviews for sea turtles listed under the Endangered Species Act of 1973. Silver Spring, Maryland: National Marine Fisheries Service. https://www.nrc.gov/docs/ML1409/ML14094A329.pdf

Poloczanska ES, Limpus CJ, Hays GC. 2009. Vulnerability of marine turtles to climate change. In: Sims DW, editor. Advances in Marine Biology. Burlington: Academic Press p. 151-211.

Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol S, Carlson TJ, Coombs S, Ellison WT, Gentry RL, Halvorsen MB. 2014. Sound exposure guidelines for fishes and sea turtles: A technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. ASA S3/SC1.4 TR-2014. Acoustical Society of America, Springer.

Prescott R. 2000. Sea turtles in New England waters. Conservation perspectives: The on-line journal of NESCB. https://www.nrc.gov/docs/ML0613/ML061390355.pdf

Pritchard PCH. 1997. Evolution, phylogeny, and current status. 1-29 p. In: Lutz PL, Musick JA (Eds). The biology of sea turtles. Boca Raton, Florida: CRC Press. Copyright protected.

Quintana E, Kraus S, Baumgartner M. 2019. Megafauna aerial surveys in the wind energy areas of Massachusetts and Rhode Island with emphasis on large whales. Summary report – Campaign 4,

2017-2018. Prepared by New England Aquarium, Anderson Cabot Center for Ocean Life and Woods Hole Oceanographic Institution.

Rabon DR, Jr., Johnson SA, Boettcher R, Dodd M, Lyons M, Murphy S, Ramsey S, Roff S, Stewart K. 2003. Confirmed leatherback turtle (*Dermochelys coriacea*) nests from North Carolina, with a summary of leatherback nesting activities north of Florida. Marine Turtle Newsletter 101:4-8.

Rafferty P, Shaver DJ, Frandsen HR, Montello M. 2019. *Lepidochelys kempii* (Kemp's ridley sea turtle) nesting. Herpetological Review 50(2).

Renewables Consulting Group. 2018. Current understanding of offshore wind's effects on the natural environment. Final briefing paper. Prepared for Natural Resources Defense Council and National Wildlife Federation.

Reubens JT, Braeckman U, Vanaverbeke J, Colen CV, Degraer S, Vincx M. 2013. Aggregation at windmill artificial reefs: CPUE of Atlantic cod (Gadus morhua) and pouting (*Trisopterus luscus*) at different habitats in the Belgian part of the North Sea. Fisheries Research 139:28–34.

Richards PM, Epperly SP, Heppell SS, King RT, Sasso CR, Moncada F, Nodarse G, Shaver DJ, Medina Y, Zurita J. 2011. Sea turtle population estimates incorporating uncertainty: A new approach applied to western north Atlantic loggerheads *Caretta caretta*. Endangered Species Research 15:151-158.

Samuel Y, Morreale SJ, Clark CW, Greene CH, Richmond ME. 2005. Underwater, low-frequency noise in a coastal sea turtle habitat. Journal of the Acoustical Society of America 117(3 Pt 1):1465-1472.

Sasso CR, Epperly SP. 2006. Seasonal sea turtle mortality risk from forced submergence in bottom trawls. Fisheries Research 81:86-88.

Schmid JR, Barichivich WJ. 2006. *Lepidochelys kempii* - Kemp's ridley. 128-141 p. In: Meylan PA (Ed). Biology and conservation of Florida turtles Chelonian Research Monographs No 3. Lunenburg, Massachusetts: Chelonian Research Foundation.

Schuyler QA, Wilcox C, Townsend K, Hardesty BD, Marshall NJ. 2014. Mistaken identity? Visual similarities of marine debris to natural prey items of sea turtles. BMC Ecology 14:14.

Schwartz FJ. 1978. Behavioral and tolerance responses to cold water temperatures by three species of sea turtles (Reptilia, Cheloniidae) in North Carolina. 16-18 p. In: Henderson GE (Ed). Proceedings of the Florida and Interregional Conference on Sea Turtles, 24-25 July 1976, Jensen Beach, Florida Florida Marine Research Publications No 33. St. Petersburg, Florida: Florida Department of Natural Resources.

Schwartz FJ. 1989. Biology and ecology of sea turtles frequenting North Carolina. In: George RY, Hulbert AW (Eds).307-311 p. North Carolina Coastal Oceanography Symposium National Undersea Research Program Research Report 89-2; December; Silver Spring, Maryland. National Oceanic and Atmospheric Administration.

Seney EE, Musick JA. 2005. Diet analysis of Kemp's ridley sea turtles *(Lepidochelys kempii)* in Virginia. Chelonian Conservation and Biology 4(4):864-871.

Shaver DJ, Rubio C. 2008. Post-nesting movement of wild and head-started Kemp's ridley sea turtles *Lepidochelys kempii* in the Gulf of Mexico. Endangered Species Research 4(1-2):43-55.

Shaver DJ, Schroeder BA, Byles RA, Burchfield PM, Peña J, Márquez R, Martinez HJ. 2005. Movements and home ranges of adult male Kemp's ridley sea turtles *(Lepidochelys kempii)* in the Gulf of Mexico investigated by satellite telemetry. Chelonian Conservation and Biology 4(4):817-827.

Shigenaka G, Milton S, Lutz P, Hoff R, Yender R, Mearns A. 2010. Oil and sea turtles: biology, planning, and response. National Oceanic and Atmospheric Administration, National Ocean Service, Office of Restoration and Response. 117 p. https://www.researchgate.net/publication/268745071_Oil_and_Sea_Turtles_Biology_Planning_and_Response.

Shimada T, Limpus C, Jones R, Hamann M. 2017. Aligning habitat use with management zoning to reduce vessel strike of sea turtles. Ocean & Coastal Management 142:163-172.

Shoop CR, Kenney RD. 1992. Seasonal distributions and abundances of loggerhead and leatherback sea turtles in waters of the northeastern United States. Herpetological Monographs 6:43-67.

Smultea Sciences. 2020a. Protected species observer technical report for the Ørsted Sunrise Wind Farm, BOEM lease areas OCS-A 0487/0500, offshore New York, 2019–2020. 195 p.

Smultea Sciences. 2020b. Protected species observer technical report for the Ørsted Sunrise Wind Farm, BOEM lease areas OCS-A 0487/0500, offshore Massachusetts and Rhode Island, 2019–2020. Final report. 93 p.

Snoek RC, Swart Rd, Didderen K, Lengkeek W, Teunis M. 2016. Potential effects of electromagnetic fields in the Dutch North Sea. Phase 1: desk study. Prepared for Rijkswaterstaat Water, Verkeer en Leefomgeving by Waterproof Marine Consultancy & Services B.V. 95 p.

Snyder DB, Bailey WH, Palmquist K, Cotts BRT, Olsen KR. 2019. Evaluation of potential EMF effects on fish species of commercial or recreational fishing importance in southern New England. Prepared for U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs by CSA Ocean Sciences Inc. 62 p. Report No.: BOEM 2019-049.

Sparks LM, DiMatteo AD. 2023. Sea turtle distribution and abundance on the east coast of the United States. NUWC-NPT Technical Report 12,428. Naval Undersea Warfare Center Division, Newport, Rhode Island.

Stantec Consulting Services Inc. (Stantec). 2020. SFWF – Montauk O&M facility in-water work. Assessment of potential impacts to natural resources from in-water work. Prepared for Deepwater Wind South Fork, LLC by Stantec Consulting Services Inc.

Stewart K, Johnson C. 2006. *Dermochelys coriacea* - leatherback sea turtle. 144-157 p. In: Meylan PA (Ed). Biology and conservation of Florida turtles Chelonian Research Monographs No 3. Lunenburg, Massachusetts: Chelonian Research Foundation.

Stone KM, Leiter SM, Kenney RD, Wikgren BC, Thompson JL, Taylor JKD, Kraus SD. 2017. Distribution and abundance of cetaceans in a wind energy development area offshore of Massachusetts and Rhode Island. Journal of Coastal Conservation 21(4):527-543.

Sunrise Wind LLC (Sunrise Wind). 2022. Safety management system - confidential. Appendix G1 in Construction and Operations Plan Sunrise Wind Farm. November 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared for Sunrise Wind LLC by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations, and future directions. Renewable and Sustainable Energy Reviews 96:380-391.

Tetra Tech and LGL. 2019. Year 2 annual survey report for New York Bight whale monitoring aerial surveys, March 2018 – February 2019. Technical report prepared by Tetra Tech, Inc. and LGL Ecological Research Associates, Inc. for New York State Department of Environmental Conservation.

Tetra Tech and LGL. 2020. Final comprehensive report for New York Bight whale monitoring aerial surveys, March 2017 – February 2020. Technical report prepared by Tetra Tech, Inc. and LGL Ecological Research Associates, Inc. for New York State Department of Environmental Conservation.

Thompson NB, Schmid JR, Epperly SP, Snover ML, Braun-McNeill J, Witzell WN, Teas WG, Csuzdi LA, Myers RA. 2001. Stock assessment of leatherback sea turtles of the western North Atlantic. In: NMFS-SEFSC (National Marine Fisheries Service-Southeast Fisheries Science Center), editor. Stock assessments of loggerhead and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-455. P. 67-104.

Thomsen F, Gill A, Kosecka M, Andersson M, Andre M, Degraer S, Folegot T, Gabriel J, Judd A, Neumann T, Norro A, Risch D, Sigray P, Wood D, Wilson B. 2015. MaRVEN – Environmental impacts of noise, vibrations and electromagnetic emissions from marine renewable energy. RTD-KI-NA-27-738-EN-N. Final study report prepared for European Commission, Directorate General for Research and Innovation.

Tomás J, Guitart R, Mateo R, Raga JA. 2002. Marine debris ingestion in loggerhead sea turtles, *Caretta caretta*, from the Western Mediterranean. Marine Pollution Bulletin 44:211-216.

Tougaard J, Hermannsen L, Madsen PT. 2020. How loud is the underwater noise from operating offshore wind turbines? Journal of the Acoustical Society of America 148:2885–2892.

TRC. 2023. Ichthyoplankton entrainment assessment. Appendix N2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

Turtle Expert Working Group (TEWG). 2007. An assessment of the leatherback turtle population in the Atlantic Ocean. Turtle Expert Working Group. 116 p. Report No. NOAA Technical Memorandum NMFS-SEFSC-555.

University of Delaware Sea Grant (UDSG). 2000. Sea turtles count on Delaware Bay. University of Delaware Sea Grant Reporter. 19:7.

United States Army Corps of Engineers (USACE). 2020. South Atlantic regional biological opinion for dredging and material placement activities in the Southeast United States. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 653 p.

United States Fish and Wildlife Service (USFWS). 2001. Nesting loggerhead sea turtle activity report 2000 and 1980-2000 nesting summary.

United States Fish and Wildlife Service (USFWS). 2005. Refuge update. Newsletter of the National Wildlife Refuge System. U.S. Fish and Wildlife Service. 1-24 p.

United States Fish and Wildlife Service and National Marine Fisheries Service (USFWS and NMFS). 1992. Recovery plan for the Kemp's ridley sea turtle (*Lepidochelys kempii*). St. Petersburg, Florida.

United States Naval Undersea Warfare Center (NUWC/EC). 2023. East Coast turtle density models. L. Sparks and A. DiMatteo. OBIS-SEAMAP. Marine Geospatial Ecology Lab / Duke University; [accessed 19 September 2023]. https://seamap.env.duke.edu/models/NUWC/EC/.

Vanderlaan ASM, Taggart CT. 2007. Vessel collisions with whales: the probability of lethal injury based on vessel speed. Marine Mammal Science 23(1):144–156. [accessed 2023 Nov 11]. https://www.phys.ocean.dal.ca/~taggart/Publications/Vanderlaan_Taggart_MarMamSci23_2007.pdf.

Vargo S, Lutz P, Odell D, Van Vleet E, Bossart G. 1986. Final report study of the effects of oil on marine turtles. Vienna, Virginia: Minerals Management Service.

Vegter AC, Barletta M, Beck C, Borrero J, Burton H, Campbell ML, Costa MF, Eriksen M, Eriksson C, Estrades A, Gilardi KV, Hardesty BD, Ivar do Sul JA, Lavers JL, Lazar B, Lebreton L, Nichols WJ, Ribic CA, Ryan PG, Schuyler QA, Smith S, Takada H, Townsend KA, Wabnitz C, Wilcox C, Young LC, Hamann M. 2014. Global research priorities to mitigate plastic pollution impacts on marine wildlife. Endangered Species Research 25(3):225-247.

Weber M. 1995. Kemp's ridley sea turtle, *Lepidochelys kempii*. 109-122 p. In: Plotkin PT (Ed). Status reviews of sea turtles listed under the Endangered Species Act of 1973. Silver Spring, Maryland: National Marine Fisheries Service.

Wellfleet Bay Wildlife Sanctuary. 2018. Summary data of cold stunned sea turtles by year and species. [accessed 20 February 2022].

Wilhelmsson D, Malm T, Ohman MC. 2006. The influence of offshore windpower on demersal fish. ICES Journal of Marine Science 63:775-784.

Winton MV, Fay G, Haas HL, Arendt M, Barco S, James MC, Sasso C, Smolowitz R. 2018. Estimating the distribution and relative density of satellite-tagged loggerhead sea turtles using geostatistical mixed effects models. Marine Ecology Progress Series 586:217-232.

Witherington B, Hirama S, Hardy R. 2012. Young sea turtles of the pelagic *Sargassum*-dominated drift community: habitat use, population density, and threats. Marine Ecology Progress Series 463:1-22.

Witherington BE, Martin RE. 2003. Understanding, assessing, and resolving light-pollution problems on sea turtle nesting beaches. St. Petersburg, Florida: Florida Fish and Wildlife Conservation Commission.

Woods Hole Group. 2022. Sediment transport modeling report. Appendix H in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Zarriello MC, Steadman DW. 1987. Historic specimens from Long Island, New York. Marine Turtle Newsletter 40:12.

K.3.11. Section 3.13 – Wetlands and Other Waters of the United States

Bureau of Ocean Energy Management (BOEM). 2023. Essential fish habitat assessment for Sunrise Wind Offshore Wind Project. May 2023. Submitted to National Marine Fisheries Service by U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Program.

DNV GL. 2021. Certified verification agent – confidential. Appendix D in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. Medford, Massachusetts: DNV-GL.

Edinger GJ, Evans DJ, Gebauer S, Howard TG, Hunt DM, Olivero AM (editors). 2014. Ecological communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Hopson AM. 2019. Impacts of anthropogenic noise on aquatic invertebrates in wetland habitats [Doctoral dissertation, Kent State University]. OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=kent15645874111271.

Hirvonen H. 2001. Impacts of highway construction and traffic on a wetland bird community. UC Davis: Road Ecology Center. [accessed 21 Nov 2023]. https://escholarship.org/uc/item/3ts9d194.

New York State Department of Environmental Conservation (NYSDEC). 2008. Coastal fish & wildlife habitat assessment form – Carmans River. December 15. [accessed 2022 Jul 18]. https://dos.ny.gov/system/files/documents/2020/03/carmans_river.pdf.

Sordello R, Ophélie R, De Lachapelle FF, Leger C, Dambry A, Vanpeene S. 2020. Environmental evidence 9(20). [accessed 2023 Nov 11]. https://environmentalevidencejournal.biomedcentral.com/track/pdf/10.1186/s13750-020-00202-y.pdf.

Stantec Consulting Services Inc. (Stantec). 2022. Offshore ecological assessment and field survey report - confidential. Appendix L in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared for Sunrise Wind LLC by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Fish and Wildlife Service (USFWS). 2022. National wetland inventory mapper. 2022. [accessed 2022 Jun 09]. http://www.fws.gov/wetlands/Data/Mapper.html.

K.3.12. Section 3.14 – Commercial Fisheries and For-Hire Recreational Fishing

Andersson MH, Dock-Åkerman E, Ubral-Hedenberg R, Öhman MC, Sigray P. 2007. Swimming behavior of roach (*Rutilus rutilus*) and three-spined stickleback (*Gasterosteus aculeatus*) in response to wind power noise and single-tone frequencies. AMBIO 36(8):636–638.

Atlantic States Marine Fisheries Commission (ASMFC). 2021. Fisheries management. [accessed 2022 Jun 10]. http://www.asmfc.org/fisheries-management/program-overview.

Bald J, Hernández C, Uriarte A, Alonso D, Ruiz P, Ortega N, Enciso YT, Marina D. 2015. Acoustic characterization of submarine cable installation in the Biscay marine energy platform (bimep). In: Bilbao Marine Energy Week; Bilbao (Spain).

Barange M, Bahri T, Beveridge M, Cochrane K, Funge-Smith S, Poulain F. 2018. Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options. FAO Fisheries and Aquaculture Technical Paper 627. Rome, Italy.

Bureau of Ocean Energy Management (BOEM). 2018. Commercial fishing frequently asked questions. Wind energy on the outer continental shelf. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/uploadedFiles/BOEM-Fishing FAQs.pdf.

Bureau of Ocean Energy Management (BOEM). 2019. National environmental policy act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic outer continental shelf. OCS Study BOEM 2019-036. May 2019. 201 p.

Bureau of Ocean Energy Management (BOEM). 2021a. Vineyard Wind 1 Offshore Wind Energy Project final environmental impact statement. OCS EIS/EA BOEM 2021-0012. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Vineyard-Wind-1-FEIS-Volume-1.pdf.

Bureau of Ocean Energy Management (BOEM). 2021b. South Fork Wind Farm and South Fork Export Cable Project final environmental impact statement. OCS EIS/EA BOEM 2020-057. [accessed 2022 Jun 10]. https://www.boem.gov/renewable-energy/state-activities/sfwf-feis.

Colburn LL, Jepson M, Weng C, Seara T, Weiss J, Hare JA. 2016. Indicators of climate change and social vulnerability in fishing dependent communities along the eastern and Gulf Coasts of the United States. Marine Policy 74 (December):323–333.

Curtis, T. 2023. Personal communication between T. Curtis with NMFS and Ursula Howson with BOEM. January 2023.

Denes SL, Zeddies DG, Weirathmueller MM. 2021. Turbine foundation and cable installation at South Fork Wind Farm: underwater acoustic modeling of construction noise. Appendix J1 in Construction and Operations Plan South Fork Wind Farm. Silver Spring, Maryland: JASCO Applied Sciences.

DNV-GL. 2021. South Fork Wind Farm navigation safety risk assessment. Appendix M in Construction and Operations Plan South Fork Wind Farm. Prepared for Deepwater Wind, LLC. Document No. 10057311-HOU-R-01. Medford, Massachusetts: DNV-GL.

DNV-GL. 2022. Navigation safety risk assessment. Appendix X in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Ecology and Environment, Inc. 2013. Development of mitigation measures to address potential use conflicts between commercial wind energy lessees/grantees and commercial fishers on the Atlantic outer continental shelf: Report on best management practices and mitigation measures. OCS Study BOEM 2014-654. Final report. Herndon, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewal Energy Programs.

English PA, Mason TI, Backstrom JT, Tibbles BJ, Mackay AA, Smith MJ, Mitchell T. 2017. Improving efficiencies of national environmental policy act documentation for offshore wind facilities case studies report. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2017-026.

Fabrizio MC, Manderson JP, Pessutti JP. 2014. Home range and seasonal movements of black sea bass (*Centropristis striata*) during their Inshore residency at a reef in the Mid-Atlantic Bight. Fishery Bulletin 112:82–97.

Glazier E, Thunberg E, McPherson M, Jepson M, Colburn LL. 2022. Marine fisheries and the Covid-19 pandemic: calendar year 2020 survey data and analysis. NOAA Technical Memorandum NMFS-F/SPO-233. June 2022. https://repository.library.noaa.gov/view/noaa/47715/noaa_47715_DS1.pdf.

Hare JA, Morrison WE, Nelson MW, Stachura MM, Teeters EJ, Griffis RB, Alexander MA, Scott JD, Alade L, Bell RJ. 2016. A vulnerability assessment of fish and invertebrates to climate change on the Northeast U.S. Continental Shelf. PLoS ONE 11(2):e0146756.

Inspire Environmental (Inspire). 2022. Commercial and recreational fisheries data report. Appendix V in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind, LLC and Stantec Consulting Services, Inc. August 2022.

Jones IT, Stanley JA, Mooney TA. 2020. Impulsive pile driving noise elicits alarm responses in squid (*Doryteuthis pealeii*). Marine Pollution Bulletin 150:110792.

Kirkpatrick AJ, Benjamin S, DePiper GS, Murphy SST, Demarest C. 2017. Socio-economic impact of outer continental shelf wind energy development on fisheries in the U.S. Atlantic. Vol. II—Appendices. U.S. Department of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region. Washington, D.C.

McClenachan L, Grabowski J, Marra M, McKeon CS, Neal BP, Record NR, Scyphers SB. 2019. Shifting perceptions of rapid temperature changes' effects on marine fisheries, 1945–2017. Fish and Fisheries 2019(00):1–13. 10.1111/faf.12400.

McCreary S, Brooks B. 2019. Atlantic Large whale take reduction team meeting: key outcomes meeting. April 23–26, 2019. Providence, Rhode Island. https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan.

Mid-Atlantic Fishery Management Council (MAFMC). 2021. Fishery management plans and amendments. [accessed 2022 Jun 10]. https://www.mafmc.org/fishery-management-plans.

Mueller-Blenkle C, McGregor PK, Gill AB, Andersson MH, Metcalfe J, Bendall V, Sigray P, Wood DT, Thomsen F. 2010. Effects of pile-driving noise on the behaviour of marine fish. COWRIE Ref: Fish 06-08; Cefas Ref: C3371. 62 p.

Murray G, Johnson T, McCay BJ, Danko M, St. Martin K, Takahashi S. 2010. Creeping enclosure, cumulative effects and the marine commons of New Jersey. International Journal of the Commons 4(1):367–389.

National Marine Fisheries Service (NMFS). 2019. NMFS Office of Law Enforcement. Personal communication. September.

National Marine Fisheries Service (NMFS). 2021a. Greater Atlantic Regional Fisheries Office (GARFO). Personal communication. May.

National Marine Fisheries Service (NMFS). 2021b. Consolidated Atlantic highly migratory species management plan. [accessed 2022 Jun 10]. https://www.fisheries.noaa.gov/management-plan/consolidated-atlantic-highly-migratory-species-management-plan.

National Marine Fisheries Service (NMFS). 2021c. Commercial fisheries landings: annual commercial landings statistics. [accessed 2022 Jun 10]. https://www.fisheries.noaa.gov/foss/f?p=215:200:2279965787496::NO:RP.

National Marine Fisheries Service (NMFS). 2021d. Program glossary. [accessed 2022 Jun 10]. https://www.st.nmfs.noaa.gov/st1/recreational/overview/glossary.html.

National Marine Fisheries Service (NMFS). 2021e. Landings and revenue data for wind energy areas, 2007-2019. [accessed 2021 Aug 07]. https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/WIND/ALL_WEA_BY_AREA_DATA.html.

National Marine Fisheries Service (NMFS). 2022. Chesapeake Bay distinct population segment of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) 5-year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. [accessed 2023 Nov 11]. https://media.fisheries.noaa.gov/2022-02/Atlantic%20sturgeon%20CB%205-year%20review_FINAL%20SIGNED.pdf.

National Marine Fisheries Service (NMFS). 2022a. Sunrise Wind data request for commercial and recreational fishing data for the updated lease area provided by NMFS via email from Benjamin Galuardi to Ursula Howson on May 24, 2022.

National Marine Fisheries Service (NMFS). 2022b. Socioeconomic impacts of Atlantic offshore wind development. [accessed 2022 Jun 10]. https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development.

National Oceanic and Atmospheric Administration (NOAA). 2022. Social indicators for coastal communities. [accessed 2022 Jun 10]. https://www.st.nmfs.noaa.gov/data-and-tools/social-indicators/.

Nedwell J, Howell D. 2004. A review of offshore windfarm related underwater noise sources. 63 p. https://tethys.pnnl.gov/sites/default/files/publications/Nedwell-Howell-2004.pdf.

New England Fishery Management Council (NEFMC). 2021. Management plans. [accessed 2022 Jun 10]. https://www.nefmc.org/management-plans.

O'Farrell, S., I. Chollett, J. N. Sanchirico, and L. Perruso. 2019. Classifying fishing behavioral diversity using high-frequency movement data. Proceedings of the National Academy of Sciences of the United States of America 116(34):16811–16816.

Ørsted Offshore North America. 2021. Fisheries communication and outreach plan. Appendix B in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. October 2021.

Papaioannou, E. A., R. L. Selden, J. Olson, B. J. McCay, M. L. Pinsky, and K. St. Martin. 2021. Not All Those Who Wander Are Lost – Responses of Fishers' Communities to Shifts in the Distribution and Abundance of Fish. Frontiers in Marine Science 8 (July):1–25.

Purser J, Radford AN. 2011. Acoustic noise induces attention shifts and reduces foraging performance in three-spined sticklebacks (*Gasterosteus aculeatus*). PLOS ONE 6(2):e17478.

Responsible Offshore Development Alliance (RODA). 2021. Comment letter RE: Notice of intent to prepare an environmental impact statement for Ocean Wind, LLC's proposed wind energy facility offshore New Jersey. Docket No. BOEM-2021-0652. Dated April 29, 2021.

Roberts, L. and M. Elliott. 2017. Good or bad vibrations? Impacts of anthropogenic vibration on the marine epibenthos. Science of the Total Environment 595:255–268.

Rogers LA, Griffin R, Young T, Fuller E, Martin KS, Pinsky ML. 2019. Shifting habitats expose fishing communities to risk under climate change. Nature Climate Change 9 (7):512–516.

Secor DH, Zhang F, O'Brien MHP, Li M. 2018. Ocean destratification and fish evacuation caused by a Mid-Atlantic tropical storm. ICES Journal of Marine Science 76(2):573–584.

Skalski JR, Pearson WH, Malme CI. 1992. Effects of sound from a geophysical survey device on catch-per-unit-effort in a hook-and-line fishery for rockfish (*Sebastes* spp.). Canadian Journal of Fisheries and Aquatic Sciences 49:1357–1365.

Stanley JA, Caiger PE, Jones IT, Van Parijs SM, Phelan B, Shelledy K, Mooney TA. 2023. Behavioral effects of sound sources from offshore renewable energy construction on the back sea bass (*Centropristis striata)* and longfin squid *(Doryteuthis pealeii).* Prepared for Bureau of Ocean Energy Management by Woods Hole Oceanographic Institute. Report No.: OCS Study BOEM 2022-004.

Steinback S, Brinson A. 2013. The economics of the recreational for-hire fishing industry in the northeast United States. U.S. Dept. Commerce, Northeast Fisheries Science Center. Ref Doc. 13-03; 49 p. [accessed 2022 Jun 10]. https://www.savingseafood.org/images/recreational_econ.pdf.

Sunrise Wind LLC (Sunrise Wind). 2022. Fisheries and benthic monitoring plan. Appendix AA1 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared for Sunrise Wind LLC by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: knowledge gaps, recommendations, and future directions. Renewable and Sustainable Energy Reviews 96: 380–391.

ten Brink TS, Dalton T. 2018. Perceptions of commercial and recreational fishers on the potential ecological impacts of the Block Island Wind Farm (U.S.A.). Frontiers in Marine Science 5:1–13.

Wysocki LE, Amoser S, Ladich F. 2007. Diversity in ambient noise in European freshwater habitats: noise levels, spectral profiles, and impact on fishes. Journal of the Acoustical Society of America 121(5):2559–2566.

K.3.13. Section 3.15 – Cultural Resources

Bureau of Ocean Energy Management (BOEM). 2019. National environmental policy act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic Continental Shelf. Sterling, VA: U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study 2019- 036.

Bureau of Ocean Energy Management (BOEM). 2020. Guidelines for providing archaeological and historic property information pursuant to 30 CFR Part 585. https://www.boem.gov/sites/default/files/documents/about-

boem/Archaeology%20and%20Historic%20Property%20Guidelines.pdf. Accessed October 1, 2021.

Council on Environmental Quality (CEQ) and Advisory Council on Historic Preservation (ACHP). 2013. NEPA and NHPA: a handbook for integrating NEPA and section 106. [accessed 2022 Jun 09]. https://www.achp.gov/digital-library-section-106-landing/nepa-and-nhpa-handbook-integrating-nepa-and-section-106.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2021a. Onshore above-ground historic properties report - confidential. Appendix U in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2021.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2021b. Terrestrial archaeological resources phase 1A assessment - confidential. Appendix S1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2021.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2023a. Terrestrial archaeological resources phase 1B assessment - confidential. Appendix S2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2023b. Historic resources visual effects assessment. Appendix T in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. June 2023.

R. Christopher Goodwin & Associates, Inc. (RCG&A). 2023. Phase 1 marine archaeological resources assessment for the Sunrise Wind Farm located on the Outer Continental Shelf Block OCS-487, and offshore New York. Draft. Appendix R in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

Sunrise Wind LLC (Sunrise Wind). 2023a. Construction & operations plan. Sunrise Wind Farm Project. Prepared for Sunrise Wind LLC by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sunrise Wind LLC (Sunrise Wind). 2023b. Cultural resources avoidance, minimization, and mitigation measures - confidential. Appendix Z in Construction and Operations Plan Sunrise Wind Farm. March 2023.

TRC Environmental Corporation 2012. Inventory and analysis of archaeological site occurrence on the Atlantic outer continental shelf. New Orleans, LA: U.S. Department of the Interior, Bureau of Ocean Energy, Gulf of Mexico OCS Region. Report No. OCS Study BOEM 2012-008.

K.3.14. Section 3.16 – Demographics, Employment, and Economics

AKRF, Inc. (AKRF). 2020. Economic modeling report confidential. Appendix W in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. December 1, 2020.

American Wind Energy Association (AWEA) 2020. U.S. offshore wind power economic impact assessment. [accessed 2022 Jun 09]. https://supportoffshorewind.org/wp-content/uploads/sites/6/2020/03/AWEA_Offshore-Wind-Economic-ImpactsV3.pdf.

Atkinson-Palombo C, Hoen B. 2014. Relationship between wind turbines and residential property values in Massachusetts: a joint report of University of Connecticut and Lawrence Berkeley National Laboratory. [accessed 2022 Jun 09]. http://files.masscec.com/research/RelationshipWind TurbinesandResidentialPropertyValuesinMassachusetts.pdf.

Bureau of Economic Analysis (BEA). 2018. Local area personal income: new estimates for 2017; comprehensive updates for 2001-2016: BEA 18-63. November 15, 2018. U.S. Department of Commerce. [accessed 2022 Jun 10]. https://www.bea.gov/news/2018/local-area-personal-income.

Bureau of Economic Analysis (BEA). 2019. Gross domestic product by state: first quarter of 2019: BEA 19-37. July 25. U.S. Department of Commerce. [accessed 2022 Jun 10]. https://www.bea.gov/news/2019/gross-domestic-product-state-first-quarter-2019.

Bureau of Economic Analysis (BEA). 2020. Current-dollar gross domestic product (GDP) by state and region, 2018: Q1–2019: Q4. [accessed 2022 Jun 09]. https://www.bea.gov/data/gdp/gdp-state.

Bureau of Economic Analysis (BEA). 2022. Table SAGDP1 gross domestic product (GDP) summary, annual by state. https://www.bea.gov/data/gdp/gdp-state.

Bureau of Ocean Energy Management (BOEM). 2021. Vineyard Wind 1 Offshore Wind Energy Project – FEIS. March 2021. [accessed 2022 Jun 10]. https://www.boem.gov/vineyard-wind.

BVG Associates Limited (BVG). 2017. U.S. Job creation in offshore wind: a report for the roadmap project for multi-state cooperation on offshore wind. Final Report. Report No. 17-22. Prepared for New York State Energy Research and Development Authority (NYSERDA). [accessed 2022 Jun 10]. https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/US-job-creation-in-offshore-wind.pdf.

Connecticut Department of Labor. 2018. Labor force monthly data with annual averages by county (2018). [accessed 2022 Jun 10]. https://www1.ctdol.state.ct.us/lmi/laus/lauscty.asp.

E2. 2018. Offshore wind – generating economic benefits on the east coast. [accessed 2022 Jun 09]. https://www.e2.org/wp-content/uploads/2018/08/E2-OCS-Report-Final-8.30.18.pdf.

Georgetown Economic Services, LLC (Georgetown Economic Services). 2020. Potential employment impact from offshore wind in the United States: The Mid-Atlantic and New England region. July 27, 2020. [accessed 2022 Jun 09]. https://rodafisheries.org/wp-content/uploads/2020/09/RODA-Paper_Final-Version-7.27.2020.pdf.

Gould R, Cresswell E. 2017. New York State and the jobs of offshore wind energy. Workforce Development Institute, New York. [accessed 2022 Jun 09]. https://wdiny.org/Portals/0/New%20York%20State%20and%20The%20Jobs%20Of%20Offshore%20Wind%20Energy_%20WDI2017.pdf.

ICF Incorporated, LLC (ICF). 2012. Atlantic region wind energy development: recreation and tourism economic baseline development. Impacts of offshore wind on tourism and recreation economies. OCS Study BOEM 2012-085.

Jensen CU, Panduro TE, Lundhede TH, Nielsen ASE, Dalsgaard M, Thorsen BJ. 2018. The impact of on-shore and off-shore wind turbine farms on property prices. Elsevier – Energy Policy 116 (2018) 50-59. [accessed 2022 Jun 09]. http://macroecointern.dk/pdf-reprints/Jensen_EP_2018.pdf.

Lutzeyer S, Phaneuf DJ, Taylor LO. 2017. The amenity costs of offshore windfarms: evidence from a choice experiment. (CEnREP Working Paper No. 17-017). Raleigh, NC: Center for Environmental and Resource Economic Policy. August 2017.

Massachusetts Executive Office of Labor and Workforce Development. 2019. Labor force and unemployment data. [accessed 2021 Aug 12]. http://lmi2.detma.org/lmi/lmi_lur_a.asp.

National Oceanic and Atmospheric Administration (NOAA). 2018. Office for Coastal Management. DigitalCoast ENOW explorer. [accessed 2022 Jun 09]. https://coast.noaa.gov/digitalcoast/tools/enow.html.

National Oceanic and Atmospheric Administration (NOAA). 2022. ENOW for self-employed workers data set. [accessed 2022 Jun 09]. https://coast.noaa.gov/digitalcoast/data/enow-nes.html.

National Renewable Energy Laboratory (NREL). 2023. A Supply Chain Road Map for Offshore Wind Energy in the United States. [accessed 2023 Feb 01]. https://www.nrel.gov/docs/fy23osti/84710.pdf.

National Renewable Energy Laboratory (NREL). 2022. U.S. Offshore Wind Workforce Assessment. [accessed 2022 Nov 11]. https://www.nrel.gov/docs/fy23osti/81798.pdf.

New York State Department of Labor. 2019. Labor area unemployment statistics program. [accessed 2020 Jun 10]. https://labor.ny.gov/stats/lslaus.shtm. https://portofnewbedford.org/the-new-bedfordport-authority/.

Parsons G, Firestone J. 2018. Atlantic offshore wind energy development: values and implications for recreation and tourism. U.S. Department of the Interior, Bureau of Ocean Energy Management. [accessed 2022 Jun 09]. https://espis.boem.gov/final%20reports/5662.pdf.

Rhode Island Department of Labor and Training. 2019a. Rhode Island labor force statistics (not seasonally adjusted), 1976 – present. [accessed 2022 Jun 09]. http://www.dlt.ri.gov/lmi/laus/state/unadj.htm.

Rhode Island Department of Labor and Training. 2019b. Providence County labor force statistics. [accessed 2022 Jun 09]. http://www.dlt.ri.gov/lmi/pdf/towns/providencecounty.pdf.

Rhode Island Department of Labor and Training. 2019c. Washington County labor force statistics. [accessed 2022 Jun 09]. http://www.dlt.ri.gov/lmi/pdf/towns/washingtoncounty.pdf.

Sunrise Wind LLC (Sunrise Wind). 2023a. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sunrise Wind LLC (Sunrise Wind). 2023b. Website news announcement on March 20, 2023. [accessed 2023 Mar 30]. https://sunrisewindny.com/news/2023/03/local-benefits-agreements-to-advance-sunrise-wind-project.

United States Bureau of Labor Statistics (USBLS). 2019. Local area unemployment statistics. [accessed 2022 Jun 09]. https://www.bls.gov/lau/.

United States Bureau of Labor Statistics (USBLS). 2020. Labor force data by county, 2018 annual averages. [accessed 2022 Jun 09]. https://www.bls.gov/lau/laucnty18.txt.

United States Census Bureau (USCB). 2000. DP-1: profile of general demographic characteristics: 2000. Census 2000 summary file 1 100-percent data. [accessed 2022 Jun 10]. https://www.census.gov/library/publications/2001/dec/2kh.html.

United States Census Bureau (USCB). 2010. DP-1: profile of general population and housing characteristics: 2010. 2010 demographic profile data. [accessed 2022 Jun 10]. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

United States Census Bureau (USCB). 2018a. 2014-2018 American community survey 5-year estimates. [accessed 2022 Jun 10]. https://www.census.gov/newsroom/press-releases/2019/acs-5-year.html.

United States Census Bureau (USCB). 2018b. B25004: vacancy status. 2014-2018 American community survey 5-year estimates. Prepared by Social Explorer. [accessed 2022 Jun 10]. socialexplorer.com.

United States Census Bureau (USCB). 2018c. B25075: value universe: owner-occupied housing units. 2014-2018 American community survey 5-year estimates. Prepared by Social Explorer. [accessed 2022 Jun 10]. socialexplorer.com.

United States Census Bureau (USCB). 2019. Quick facts. [accessed 2022 Jun 10]. https://www.census.gov/quickfacts/fact/table/US/PST045221.

University of Delaware. 2019. Supply chain contracting forecast for U.S. offshore wind power: special initiative on offshore wind. March 2019. [accessed 2022 Jun 09]. https://www.noia.org/wp-content/uploads/2019/05/SIOW-Paper.pdf.

K.3.15. Section 3.17 – Environmental Justice

Buonocore JJ, Luckow P, Fisher J, Kempton W, Levy JL. 2016. Health and climate benefits of offshore wind facilities in the Mid-Atlantic United States. Environmental Research Letters 11: 074019.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 1993. Environmental equity policy. [accessed 2022 Jun 10]. https://portal.ct.gov/DEEP/Environmental-Justice/Environmental-Equity-Policy.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 2021. Connecticut 2021 environmental justice communities digital map. [accessed 2022 Jun 10]. https://ctdeep.maps.arcgis.com/apps/webappviewer/index.html?id=d04ec429d0a4477b9526689dc7809ffe.

Connecticut Department of Energy and Environmental Protection (CT DEEP). 2022. Environmental justice communities webpage. [accessed 2022 Jun 10]. https://portal.ct.gov/DEEP/Environmental-Justice/Environmental-Justice-Communities#Map.

Council on Environmental Quality (CEQ). 1997. Environmental justice: guidance under the national environmental policy act. Washington, D.C.: Executive Office of the President. [accessed 2022 Jun 09]. https://ceq.doe.gov/docs/ceq-regulations-and-guidance/regs/ej/justice.pdf.

Exponent Engineering P.C. 2022. Onshore acoustic assessment. Appendix I2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. July 2022.

Massachusetts Executive Office of Energy and Environmental Affairs (EEA). 2020 Environmental justice populations GIS layer. June 2021. [accessed 2022 Jun 09]. https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

Massachusetts Executive Office of Energy and Environmental Affairs (EEA). 2021. Environmental justice policy of the EEA. [accessed 2022 Jun 10]. https://www.mass.gov/doc/environmental-justice-policy6242021-update/download.

Maryland Commission on Environmental Justice and Sustainable Communities. 2021. Annual report 2020-2021. [accessed 2022 Jun 09]. https://mde.maryland.gov/programs/crossmedia/EnvironmentalJustice/Documents/CEJSC%202021%20Annual%20Report.pdf.

National Oceanic and Atmospheric Administration (NOAA). 2022a. ENOW for self-employed workers data set. [accessed 2022 Jun 09]. https://coast.noaa.gov/digitalcoast/data/enow-nes.html.

National Oceanic and Atmospheric Administration (NOAA). 2022b. Social indicators for coastal communities. [accessed 2022 Jul 27]. https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators-coastal-communities.

New Jersey Department of Environmental Protection (NJ DEP). 2020. Overburdened communities under the New Jersey environmental justice law GIS layer. January 2020 [updated January 2021; accessed 2022 Jun 09]. https://gisdata-njdep.opendata.arcgis.com/datasets/njdep:overburdened-communities-under-the-new-jersey-environmental-justice-law/about.

New York State Department of Environmental Conservation (NYSDEC). 2003. Commissioner policy 29, environmental justice and permitting. [accessed 2022 Jun 09]. https://www.dec.ny.gov/docs/permits_ej_operations_pdf/cp29a.pdf.

New York State Department of Environmental Conservation (NYSDEC). 2021. Office of environmental justice potential environmental justice areas GIS layer. May 2021. [accessed 2022 Jun 09]. https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1273.

New York State Department of Environmental Conservation (NYSDEC). 2022. Establishing a value of carbon guidelines for use by state agencies. [accessed 2022 Feb 14] https://www.dec.ny.gov/docs/administration_pdf/vocguid22.pdf.

New York State Energy Research and Development Authority (NYSERDA). 2021. New York State disadvantaged communities barriers and opportunities. Report No. 21-35. [accessed 2022 Jun 10]. https://climate.ny.gov/-/media/Project/Climate/Files/21-35-NY-Disadvantaged-Communities-Barriers-and-Opportunities-Report.ashx.

R. Christopher Goodwin & Associates, Inc. (RCG&A). 2023. Phase 1 marine archaeological resources assessment for the Sunrise Wind Farm located on the Outer Continental Shelf Block OCS-487, and offshore New York (draft). Appendix R in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. February 2023.

Rhode Island Department of Environmental Management (RIDEM). 2009. Policy for considering environmental justice in the review of investigation and remediation of contaminated properties. [accessed 2022 Jun 09]. http://www.dem.ri.gov/envequity/pdf/ejfinal.pdf.

Rhode Island Department of Environmental Management (RIDEM). 2022. RIDEM environmental resource map. Boundaries and regulatory overlays – RIDEM environmental justice area 2022. [accessed 2022 Jun 09]. https://ridemgis.maps.arcgis.com/apps/webappviewer/index.html?id=87e104c8adb449eb9f905e5f18020de5.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared for Sunrise Wind LLC by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Thind MPS, Tessum CW, Azevedo IL, Marshall JD. 2019. Fine particulate air pollution from electricity generation in the U.S.: Health impacts by race, income, and geography: abstract. Environ. Sci. Technol. 53(23): 14010-14019. [accessed 2022 Jun 09]. https://pubs.acs.org/doi/abs/10.1021/acs.est.9b02527.

United States Census Bureau (USCB) 2018a. B17001: Poverty status in the past 12 months by sex by age – universe: population for whom poverty status is determined. 2014-2018 American community survey 5-year estimates. Prepared by Social Explorer. [accessed 2022 Jun 10]. socialexplorer.com.

United States Census Bureau (USCB). 2018b. B03002 Hispanic or Latino origin by race. 2014-2018 American community survey 5-year estimates. Prepared by Social Explorer. [accessed 2022 Jun 10]. https://www.socialexplorer.com/data/ACS2018_5yr/metadata/?ds=ACS18_5yr&table=B03002.

United States Census Bureau (USCB). 2022. United States Census Bureau data tables. [accessed 2022 Jul 28]. https://data.census.gov/cedsci/table.

United States Environmental Protection Agency (USEPA). 2016a. Promising practices for EJ methodologies in NEPA reviews: Report for the federal interagency working group on environmental justice & NEPA committee. [accessed 2022 Jun 09]. https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

United States Environmental Protection Agency (USEPA) 2016b. Technical guidance for assessing environmental justice in regulatory analysis. [accessed 2022 Jun 09]. https://www.epa.gov/sites/default/files/2016-06/documents/ejtg_5_6_16_v5.1.pdf.

United States Environmental Protection Agency (USEPA) 2022a. EJSCREEN technical documentation and data. [accessed 2022 Jun 09]. https://www.epa.gov/ejscreen.

United States Environmental Protection Agency (USEPA). 2022b. EJSCREEN: environmental justice screening and mapping tool. [accessed 2022 Jul 26]. https://www.epa.gov/ejscreen/download-ejscreen-data.

Virginia Department of Environmental Quality (VADEQ). 2020. Environmental justice initiative. [accessed 2022 Jun 09]. https://www.deq.virginia.gov/home/showpublisheddocument/1813/637425424131330000.

K.3.16. Section 3.18 – Land Use and Coastal Infrastructure

Bureau of Ocean Energy Management (BOEM). 2016. The identification of port modifications and their environmental and socioeconomic consequences. Washington (DC): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS BOEM Study 2016-034. 238 p.

Carver Companies. 2022. Port of Coeymans marine terminal services. [accessed 2022 Jan 20]. https://www.carvercompanies.com/port-of-coeymans-marine-terminal/.

Connecticut Port Authority. 2021. State pier infrastructure improvement project. Old Saybrook (CT): Connecticut Port Authority. [accessed 2022 Jan 20]. https://statepiernewlondon.com/.

Discover Long Island. 2023. Southaven County Park. [accessed 25 May 2023]. https://www.discoverlongisland.com/listing/southaven-county-park/548/.

Exponent Engineering P.C. 2022. Onshore acoustic assessment. Appendix I2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. July 2022.

Long Island Baptist. 2023. Long Island Baptist. [accessed 2023 May 25]. https://libaptist.com.

National Park Foundation. 2022. Fire Island National Seashore. Washington (DC): National Park Foundation. [accessed 2022 Jan 20]. https://www.nationalparks.org/connect/explore-parks/fire-island-national-seashore.

National Park Service (NPS) 2010. Acoustical toolbox: recommendations for reducing noise impacts in national parks. [accessed 2023 May 20]. https://home.nps.gov/subjects/sound/upload/AcousticalToolbox-508-2.pdf.

National Park Service (NPS). 2021. Fire Island National Seashore, New York: basic information. Washington (DC): National Park System. [last updated 2021 Sep 03; accessed 2022 Jan 20]. https://www.nps.gov/fiis/planyourvisit/basicinfo.htm.

National Park Service (NPS). 2023. Fire Island National Seashore, Smith Point County Park. [accessed 2023 May 25]. https://www.nps.gov/fiis/planyourvisit/smith-point-county-park.html.

New York State (NYS). 2022. Suffolk, County. Albany (NY): New York State. [accessed 2022 Jan 20]. https://www.ny.gov/counties/suffolk#:~:text=Suffolk%201%20Overview.%20Suffolk%20County%20is%20the%20easternmost%203%20Elected%20Officials%204%20Municipalities%205%20Contact.

Parsons G, Firestone J. 2018. Atlantic offshore wind energy development: values and implications for recreation and tourism. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 52 p. OCS Study BOEM 2018-013.

Port of Albany. 2019. Facilities. [accessed 2022 Jan 20]. https://www.portofalbany.us/what-we-do/facilities/#terminal.

Quonset Business Park. 2022. Port facilities. [accessed 2022 Jan 20]. http://www.quonset.com/sea/port-facilities/.

Suffolk County. 2016. Land use map for Brookhaven, Suffolk County, New York. [accessed 2022 Jan 20]. https://www.suffolkcountyny.gov/portals/0/formsdocs/planning/Cartography/tbr_11x17_07cd22.pdf.

Suffolk County. 2018a. General – municipal boundaries, transportation, and hospitals map of Suffolk County, New York. [accessed 2022 Jan 20]. https://www.suffolkcountyny.gov/portals/0/formsdocs/planning/Cartography/2018%20Atlas/general.pdf.

Suffolk County. 2018b. National register of historic places map of Suffolk County, New York. [accessed 2022 Jan 20]. https://www.suffolkcountyny.gov/portals/0/formsdocs/planning/Cartography/2018%20Atlas/NatRegHistoricPlaces_atlas_18cd07r.pdf.

Suffolk County. 2020. GIS maps: Land use 2016 polygon. [updated 2020 Dec 08; accessed 2022 Jan 20]. https://opendata.suffolkcountyny.gov/datasets/SuffolkGIS::landuse-2016-polygon/about.

Suffolk County Parks. 2018. Smith Point County Park. [updated 2021; accessed 2022 Jan 20]. https://www.suffolkcountyny.gov/Departments/Parks/Our-Parks/Smith-Point-County-Park.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Town of Brookhaven, New York (Brookhaven). 2022. 2020. Town of Brookhaven, New York. History. [accessed 2022 Jan 20]. https://www.brookhavenny.gov/524/History.

Town of Brookhaven, New York (Brookhaven). 2020. Town of Brookhaven, New York. Public Information. Maps. [accessed 2022 Feb 18]. https://www.brookhavenny.gov/640/Maps.

United States Coast Guard (USCG). 2022. Light list volume I, Atlantic Coast: St. Croix River, Maine to Shrewsbury River, New Jersey. [updated 2022; accessed 2022 Feb 18]. https://mdnautical.com/clipper-city-publishing/831-uscg-light-list-i-2022-atlantic-coast-st-croix-river-maine-to-shrewsbury-river-new-jersey.html.

United States Fish and Wildlife Service (USFWS). 2023. Wertheim National Wildlife Refuge. [accessed 2023 May 25]. https://www.fws.gov/refuge/wertheim.

K.3.17. Section 3.19 – Navigation and Vessel Traffic

Bureau of Ocean Energy Management (BOEM). 2019. National Environmental Policy Act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic outer continental shelf. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2019-036.

Bureau of Ocean Energy Management (BOEM). 2021. Guidelines for providing information on lighting and marking of structures supporting renewable energy development. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 9 p.

de la Vega D, Matthews J, Norin L, Angulo I. 2013. Mitigation techniques to reduce the impact of wind turbines on radar services. Energies 6. [accessed 2020 Sep 01]. https://www.mdpi.com/1996-1073/6/6/2859/htm.

DNV GL. 2020. Sunrise Wind Farm Project navigation safety risk assessment. Medford: Stantec Consulting Services Inc.

DNV-GL. 2022. Navigation safety risk assessment. Appendix X in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Dunkley F, Solandt JL. 2022. Windfarms, fishing and benthic recovery: overlaps, risks and opportunities. Marine Policy 145: 105262.

Federal Aviation Administration (FAA). 2018. Advisory circular 70/7460-1L obstruction marking and lighting. [accessed 2023 Aug 07]. https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_70_7460-1L_-_Obstuction_Marking_and_Lighting_-_Change_2.pdf.

Ghobrial L. 2020. Marine navigation radar [OSW turbine radar interference mitigation webinar series]. Department of Energy. [accessed 2020 Jul 13]. https://www.energy.gov/sites/prod/files/2020/07/f76/offshore-wind-turbine-radar-interference-mitigation-webinar-7-13-2020.pdf.

Gillman P. 2020. Offshore wind turbine radar interference mitigation (WTRIM) webinar series oceanographic high frequency (HF) radar [OSW turbine radar interference mitigation webinar

series]. Department of Energy. https://www.energy.gov/sites/prod/files/2020/07/f77/offshore-wind-turbine-radar-interference-mitigation-webinar-7-27-2020.pdf.

Hewlett JC. 1994. Ship navigation simulation study, Houston-Galveston navigation channels, Texas. Report 1. Houston Ship Channel, Bay Segment. Tech report DTIC Document.

Hong I, Murray AT. 2013. Efficient measurement of continuous space shortest distance around barriers. International Journal of Geographical Information Science 27(12): 2302-2318.

Hooper T, Ashley M, Austen M. 2015. Perceptions of fishers and developers on the co-location of offshore wind farms and decapod fisheries in the UK. Marine Policy 61: 16-22.

International Association of Marine Aids to Navigation and Lighthouse Authorities. 2013. IALA Recommendation RO139 (O-139) The Marking of Man-Made Offshore Structures. Edition 2.1. December. https://www.iala-aism.org/product/marking-of-man-made-offshore-structures-o-139/. Accessed December 5, 2023.

Munroe DM, Powell EN, Klinck JM, Scheld AM, Borsetti S, Beckensteiner J, Hofmann EE. 2022. The Atlantic surfclam fishery and offshore wind energy development: 1. Model development and verification. ICES Journal of Marine Science: fsac106.

National Academies of Sciences, Engineering, and Medicine. 2022. Wind turbine generator impacts to marine vessel radar. Washington: The National Academies Press. [accessed 27 Jul 2022] https://doi.org/10.17226/26430.

Rawson A, Brito M. 2022. Assessing the validity of navigation risk assessments: a study of offshore wind farms in the UK." Ocean & Coastal Management 219: 106078.

Rawson A, Rogers E. Assessing the impacts to vessel traffic from offshore wind farms in the Thames Estuary. Zeszyty Naukowe Akademii Morskiej w Szczecinie 43 (115) (2015): 99-107.

Slijkerman DME., Tamis JE. 2015. Fisheries displacement effects related to closed areas: a literature review of relevant aspects. https://edepot.wur.nl/366172.

Stevenson TC., Tissot BN, Walsh WJ. 2013. Socioeconomic consequences of fishing displacement from marine protected areas in Hawaii. Biological conservation 160: 50-58.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Coast Guard (USCG). 2016. Atlantic Coast port access route study. Docket no. USCG-2011-0351. [accessed 27 Jul 2022]. https://www.regulations.gov/document/USCG-2019-0279-0005.

United States Coast Guard (USCG). 2020. The areas offshore of Massachusetts and Rhode Island port access study. Docket number USCG-2019-0131. [accessed 27 Jul 2022]. https://www.regulations.gov/document/USCG-2019-0131-0101.

Yang J, Pan C, Wang C, Jiang D, Wen B. 2014. Wind turbine clutter mitigation in coastal UHF radar. The Scientific World Journal. https://doi.org/10.1155/2014/529230.

K.3.18. Section 3.20 – Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)

Baird. 2020. Re: proposal for a uniform 1 X 1 nm wind turbine layout for New England offshore wind. [accessed 2022 Jun 09]. https://static1.squarespace.com/static/5a2eae32be42d64ed467f9d1/t/5dd3d3e476d4226b2a83db25/1574163438896/Proposed+1x1+layout+from+RI-MA+Leaseholders+1+Nov+19+%281%29.pdf.

Bureau of Ocean Energy Management (BOEM). 2012. Commercial wind lease issuance and site assessment activities on the Atlantic outer continental shelf offshore Rhode Island and Massachusetts environmental assessment.

Bureau of Ocean Energy Management (BOEM). 2018. Draft guidance regarding the use of a project design envelope in a construction and operations plan. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [accessed 2022 Jun 10]. https://www.boem.gov/sites/default/files/renewable-energy-program/Draft-Design-Envelope-Guidance.pdf.

Bureau of Ocean Energy Management (BOEM).2021. Vineyard Wind 1 offshore wind energy project final environmental impact statement. OCS EIS/EA BOEM 2021-0012. [accessed 2022 April 1]. https://www.boem.gov/vineyard-wind.

Bureau of Ocean Energy Management (BOEM). 2022. NOAA Fisheries and BOEM federal survey mitigation implementation strategy – Northeast U.S. Region. Draft March 2022. [accessed 2022 Sep 30]. https://media.fisheries.noaa.gov/2022-03/NOOA%20Fisheries-and-BOEM-Federal-Survey-Mitigation_Strategy_DRAFT_508.pdf.

Colburn R, Randolph C, Drummond C, Miles M, Brody F, McGillen C, Krieger A, Jankowski R. 2020. Radar interference analysis for renewable energy facilities on the Atlantic outer continental shelf. McLean, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2020-039.

Hare JA, Blyth BJ, Ford KH, Hooker BR, Jensen BM, Lipsky A, Nachman C, Pfieffer L, Rasser M, Renshaw K. 2022. NOAA Fisheries and BOEM federal survey mitigation implementation strategy -Northeast U.S. region. NOAA Technical Memorandum 292. Woods Hole, MA. 33 pp.

Integrated Ocean Observing System. 2018. IOOS HF radar website. [accessed 2022 Jun 09]. https://hfradar.ioos.us/.

Mid-Atlantic Regional Council of the Ocean (MARCO). 2019. Mid-Atlantic Ocean data portal [MARCO]. [accessed 2022 Jun 09]. http://portal.midatlanticocean.org/visualize/#x=-

73.24&y=38.93&z=7&logo=true&controls=true&basemap=Ocean&tab=data&legends=false&layers=true.

National Academies of Sciences, Engineering, and Medicine (NAS). 2022. Wind turbine generator impacts to marine vessel radar. Washington, DC. The National Academies Press. https://doi.org/10.17226/26430.

Office for Coastal Management (OCM). 2019. DOD offshore wind mission compatibility assessments. [accessed 2022 Jun 09]. https://inport.nmfs.noaa.gov/inport/item/48875.

Rhode Island Coastal Resource Management Council (RI CRMC). 2010. Rhode Island ocean special area management plan. Adopted by RI CRMC on October 19, 2010. [accessed 2022 August 01]. http://seagrant.gso.uri.edu/oceansamp/documents.html.

Stantec Consulting Services Inc. (Stantec). 2022. Obstruction evaluation and airspace analysis. Appendix Y1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Army Corps of Engineers (USACE). 2018. Ocean dredged material disposal site database. [accessed 2022 Jun 09]. https://odd.el.erdc.dren.mil/ODMDSSearch.cfm.

United States Army Corps of Engineers (USACE) 2020. South Atlantic regional biological opinion for dredging and material placement activities in the Southeast United States. [accessed 2022 Jun 01]. https://www.fisheries.noaa.gov/content/endangered-species-act-section-7-biological-opinions-southeast.

United States Coast Guard (USCG). 2020. The areas offshore of Massachusetts and Rhode Island port access route study. USCG-2019-0131. [access 2022 Jun 10]. https://downloads.regulations.gov/USCG-2019-0131-0101/content.pdf.

Weinberg J. 2020. Northeast Fisheries Science Center liaison to the New England Fishery Management Council. New England Fishery Management Council Meeting, January 28–30, 2020. [accessed 2022 Jun 09]. https://www.nefmc.org/calendar/january-2020-council-meeting.

K.3.19. Section 3.21 – Recreation and Tourism

Block Island Ferry. 2022. Block Island wind farm tours. Narragansett (RI): The Block Island Ferry. [updated 2022 Jan 01; accessed 2022 Jun 09]. https://www.blockislandferry.com/wind-farm-tours.

Bloeser J, Chen C, Gates M, Lipsky A, Longley-Wood K. 2015. Ocean planning in the Northeast-characterization of coastal and marine recreational activity in the U.S. Northeast. Point 97, Surfrider Foundation, and SeaPlan. 251 p. [accessed 2022 Jan 20].

http://archive.neoceanplanning.org/wp-content/uploads/2015/10/Recreation-Study_Final-Report.pdf.

Bolger T. 2016. A beginner's guide to a summer on Fire Island. Long Island Press. [accessed 2022 Jan 20]. https://www.longislandpress.com/2016/05/21/a-beginners-guide-to-summer-on-fire-island/.

Brookhaven Fair. 2023. 2020 Brookhaven Fair postponed. [accessed 2023 May 26]. https://brookhavenfair.com.

Bureau of Ocean Energy Management (BOEM). 2012. Atlantic region wind energy development: recreation and tourism economic baseline development. [accessed 2022 Jan 20]. https://coast.noaa.gov/data/digitalcoast/pdf/atlantic-region-wind-energy.pdf.

Bureau of Ocean Energy Management (BOEM). 2016. The identification of port modifications and their environmental and socioeconomic consequences. Washington, DC: U.S. Department of the Interior, Bureau of Ocean Energy Management. 238 p. OCS BOEM Study 2016-034.

Discover Long Island. 2023. Smith Point County Park. [accessed 2023 May 25]. https://www.discoverlongisland.com/listing/smith-point-county-park/547/.

Federal Highway Administration (FHWA). 2018. Techniques for reviewing noise analyses and associated noise reports. Washington, DC: U.S. Department of Transportation, Federal Highway Administration. FHWA-HEP-18-067. [accessed 2022 Jan 20]. https://www.fhwa.dot.gov/Environment/noise/resources/reviewing_noise_analysis/fhwahep18067.pdf.

HDR. 2019. Field observations during wind turbine operations at the Block Island Wind Farm, Rhode Island. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2019-028. Final Report. 281 p.

ICF Incorporated, LLC (ICF). 2012. Atlantic region wind energy development: recreation and tourism economic baseline development. Impacts of offshore wind on tourism and recreation economies. Herndon, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 533 p.

Kneebone J, Capizzano C. 2020. A comprehensive assessment of baseline recreational fishing effort for highly migratory species in Southern New England and associated wind energy area. Boston (MA): Final Report to Vineyard Wind LLC. [accessed 2022 Jan 20]. https://static1.squarespace.com/static/5a2eae32be42d64ed467f9d1/t/5efe58f0e8a2c9533e89c5aa/1593727227491/Kneebone+and+Capizzano_Final+report_HMS_Vineyard+Wind_6.30.20.pdf.

Kraus SD, Leiter S, Stone K, Wikgren B, Mayo C, Hughes P, Kenney RD, Clark CW, Rice AN, Estabrook B, Tielens J. 2016. Northeast Large Pelagic Survey Collaborative Aerial and Acoustic Surveys for Large Whales and Sea Turtles. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2016-054.

Long Island Baptist. 2023. Long Island Baptist. [accessed 2023 May 25]. https://libaptist.com/.

National Marine Fisheries Service (NMFS). 2021a. NOAA current fishery statistics, No. 2019. May 21, 2021. Silver Spring, MD: U.S. Department of Commerce, NOAA. [accessed 2022 Jan 20]. https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states.

National Marine Fisheries Service (NMFS). 2021b. Recreational fishing regulations by species. [accessed 2022 Jan 20]. https://www.fisheries.noaa.gov/new-england-mid-atlantic/recreational-fishing/recreational-fishing-regulations-species#:~:text=Recreational%20Fishing%20Regulations%20by%20Species%201%20Notice%20to,9%20Atlantic%20Surf%20Clam.%20...%20More%20items...%20.

National Oceanic and Atmospheric Administration (NOAA). 2018. Quick report tool for socioeconomic data. [accessed 2022 Jan 19]. https://www.st.nmfs.noaa.gov/data-and-tools/social-indicators/

National Oceanic and Atmospheric Administration (NOAA). 2021. Recreational fishing regulations by species. Gloucester (MA): National Oceanic and Atmospheric Administration. [updated 2021 Aug 23; accessed 2022 Jan 20]. https://www.fisheries.noaa.gov/new-england-mid-atlantic/recreational-fishing/recreational-fishing-regulations-species#:~:text=Possession%20limit%3A%2015%20fish%20per%20day%20Note%20%3A,Spawning%20Protection%20Area.%20Hake%2FWhiting%20%28offshore%2C%20red%2C%20white%2C%20silver%29.

National Park Service (NPS). 2018. Fire Island National Seashore, New York. Patchogue (NY): U.S. Department of the Interior, National Park Service; [updated 2018 Apr 13; accessed 2022 Jan 20]. https://www.nps.gov/fiis/learn/historyculture/fire-island-lighthouse-history.htm.

National Park Service (NPS). 2022. Visitor spending effects – economic contributions of National Park Visitor Spending, New York. Patchogue, NY: U.S. Department of the Interior, National Park Service; [updated July 12, 2022; accessed 2022 Oct 26]. https://www.nps.gov/subjects/socialscience/vse.htm.

National Park Service (NPS). 2023a. Fire Island National Seashore, New York, water quality. [accessed 2023 May 25]. https://www.nps.gov/fiis/learn/nature/waterquality.htm.

National Park Service (NPS). 2023b. Fire Island National Seashore, Smith Point County Park. [accessed 2023 May 25]. https://www.nps.gov/fiis/planyourvisit/smith-point-county-park.htm.

National Park Service (NPS). 2023c. Fire Island National Seashore, Wilderness Visitor Center. [accessed 2023 May 25]. https://www.nps.gov/fiis/planyourvisit/wilderness-visitor-center.htm.

New York State Energy Research and Development Authority (NYSERDA). 2017. New York State offshore wind master plan: marine recreational use study. New York, NY: New York State Energy Research and Development Authority. 58 p. Report No.: 17-25m.

Ørsted Offshore North America. 2021. Fisheries communication and outreach plan. Appendix B in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. October 2021.

Parsons G, Firestone J. 2018. Atlantic offshore wind energy development: values and implications for recreation and tourism. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2018-013. 52 p.

SeaPlan. 2013. 2012 northeast recreational boater survey: a socioeconomic and spatial characterization of recreational boating in coastal and ocean waters of the Northeast United States. Boston, MA: SeaPlan. 105 p.

Stantec Consulting Services Inc. (Stantec). 2022. Offshore in-air acoustic assessment. Appendix I3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. November 2022.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Fish and Wildlife Service (USFWS). 2023. Wertheim National Wildlife Refuge. [accessed 2023 May 25]. https://www.fws.gov/refuge/wertheim.

Webster K, Porter R. 2020. Legal limits on recreation fishing near offshore wind facilities. Bristol (RI): Sea Grant Law Fellow Publications. [accessed 2022 Jan 20]. https://tethys.pnnl.gov/sites/default/files/publications/Legal-Limits-on-Recreational-Fishing-Near-Offshore-Wind-Facilities.pdf.

K.3.20. Section 3.22 – Scenic and Visual Resources

Atlantic Shores Offshore Wind Project (Atlantic Shores). 2021. Aircraft detection lighting system (ADLS) efficacy analysis. [accessed 2022 Oct 26]. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Appendix-II-M4-ADLS-Efficacy-Analysis.pdf.

Bureau of Ocean Energy Management (BOEM). 2016. The identification of port modifications and their environmental and socioeconomic consequences. Washington (DC): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS BOEM Study 2016-034. 238 p.

Bureau of Ocean Energy Management (BOEM). 2021. Assessment of seascape, landscape, and visual impacts of offshore wind developments on the outer continental shelf of the United States. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2021-032.

Environmental Design & Research (EDR). 2017. New York State offshore wind master plan visibility threshold study. December 2017. Prepared for New York State Energy Research and Development Authority. Syracuse (NY): Landscape Architecture, Engineering & Environmental Services, D.P.C.

Environmental Design & Research (EDR). 2021. Technical report: visual impact assessment of the Sunrise Wind Farm, revision 1, updated October 2021. Prepared for Sunrise Wind LLC. Syracuse (NY): Landscape Architecture, Engineering & Environmental Services, D.P.C.

Environmental Design & Research (EDR). 2022a. Response to BOEM request for information, dated February 2, 2022.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2022b. Offshore visual impact assessment. Appendix Q1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. November 2022.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2022c. Onshore visual resource assessment. Appendix Q2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. November 2022.

Landscape Institute and Institute of Environmental Management and Assessment. 2016. Guidelines for landscape and visual impact assessment (3rd Edition). England and Wales: Landscape Institute.

Merrill J. 2010. Fog and icing occurrence and air quality factors for the Rhode Island ocean special area management plan. [accessed 2022 Mar 08]. http://www.crmc.ri.gov/samp_ocean/finalapproved/TechRep07-Merrill_fogiceoz.pdf.

National Park Foundation. 2022. Fire Island National Seashore. Washington (DC): National Park Foundation. [accessed 2023 May 25].https://www.nationalparks.org/connect/explore-parks/fire-island-national-seashore.

National Park Service (NPS). 2022. Fire Island National Seashore, New York, water quality. [accessed 2023 May 25]. https://www.nps.gov/fiis/learn/nature/waterquality.htm.

National Park Service (NPS). 2023. Fire Island National Seashore, Smith Point County Park. [accessed 2023 May 25]. https://www.nps.gov/fiis/planyourvisit/smith-point-county-park.html.

National Oceanic and Atmospheric Administration National Data Buoy Center (NOAA NDBC). 2020. Station 44017 – climatic summary plots for air temperature. [accessed 2022 Jun 09]. https://www.ndbc.noaa.gov/view_climplot.php?station=44017&meas=at.

Rhode Island Coastal Resources Management Council (RI CRMC). 2010. Rhode Island ocean special area management plan. [updated October 19, 2010; accessed 2022 Mar 08]. http://www.crmc.ri.gov/samp_ocean.html.

South Fork Wind LLC (South Fork Wind). 2018. Construction and operations plan South Fork Wind Farm Project. Revision 3, updated May 2021. Submitted to Bureau of Ocean Energy Management. Dallas (TX): Jacobs Engineering Group Inc. [accessed 2022 May 27]. https://www.boem.gov/renewable-energy/state-activities/south-fork.

Suffolk County. 2016. Land use map for Brookhaven, Suffolk County, New York. [accessed 2022 Mar 08]. https://www.suffolkcountyny.gov/portals/0/formsdocs/planning/Cartography/tbr_11x17_07cd22.pdf.

Suffolk County. 2020. GIS maps: land use 2016 polygon. [updated 2020 Dec 08; accessed 2022 Mar 08]. https://opendata.suffolkcountyny.gov/datasets/SuffolkGIS::landuse-2016-polygon/about.

Suffolk County Parks. 2018. Smith Point County Park. [updated 2021; accessed 2022 Mar 08]. https://www.suffolkcountyny.gov/Departments/Parks/Our-Parks/Smith-Point-County-Park.

Sullivan RG, Kirchler LB, Cothren J, Winters SL. 2013. Offshore wind turbine visibility and visual impact threshold distances. Environ. Pract. 15(1):33–49.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Town of Brookhaven, New York (Brookhaven). 2022. History. Brookhaven (NY): Town of Brookhaven, New York. [accessed 2022 Mar 08]. https://www.brookhavenny.gov/524/History.

K.4. Appendices

K.4.1. Appendix A

Bureau of Ocean Energy Management (BOEM). 2018. BOEM Tribal consultation guidance. [accessed 2019 Jun 22]. https://www.boem.gov/BOEM-Tribal-Consultation-Guidance/.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

K.4.2. Appendix B

Christiansen MB, Hasager C. 2005. Wake effects of large offshore wind farms identified from satellite SAR. Remote Sensing of Environment 98:251–268.

Collette BB, Klein-MacPhee G (Eds). 2002. Bigelow and Schroeder's fishes of the Gulf of Maine. 3rd Edition. Washington, DC: Smithsonian Institution Press.

Díaz JP, Expósito FJ, Pérez JC, González A. 2019. Long-term trends in marine boundary layer properties over the Atlantic Ocean. Journal of Climate 34(22):2991–3004.

Fuhlbrügge S, Krüger K, Quack B, Atlas E, Hepach H, Ziska F. 2013. Impact of the marine atmospheric boundary layer conditions on VSLS abundances in the eastern tropical and subtropical North Atlantic Ocean. Atmos. Chem. Phys. 13:6345–6357.

Holzworth GC. 1972. Mixing heights, wind speeds, and potential for urban sir pollution throughout the contiguous United States. U.S. Environmental Protection Agency, Office of Air Programs, Research Triangle Park, North Carolina. January 1972. [accessed 2023 Oct 08]. https://www.nrc.gov/ docs/ML1408/ML14084A177.pdf.

McAdie C J, Landsea CW, Neumann CJ, David JE, Blake ES, Hammer GR. 2009. Tropical cyclones of the north Atlantic Ocean, 1851–2006 (with 2007 and 2008 track maps included). Historical Climatology Series 6-2. Prepared by the National Climatic Data Center, Asheville, NC, in cooperation with the National Hurricane Center, Miami, FL. [accessed 2023 Oct 08] https://www.nhc.noaa.gov/pdf/TC_Book_Atl_1851-2006_lowres.pdf.

New York State Climate Action Council. 2010. Climate action plan interim report. Chapter 2: climate projections and vulnerabilities. [accessed 2023 Oct 08]. https://www.dec.ny.gov/docs/administration_pdf/irchap2.pdf.

National Oceanic and Atmospheric Administration (NOAA). 2023. Station 44017 (LLNR 665) – Montauk Point– 23 NM SSW of Montauk Point, NY. National Oceanic and Atmospheric Administration's National Data Buoy Center. Page last modified: October 9, 2023. [accessed 2023 Oct 09]. https://www.ndbc.noaa.gov/station_page.php?station=44017.

National Oceanic and Atmospheric Administration National Centers for Environmental information. (NOAA NCEI). 2019. Storm events database. [accessed 2023 Oct 09]. https://www.ncdc.noaa.gov/stormevents/.

National Oceanic and Atmospheric Administration National Centers for Environmental Information (NOAA NECI). 2021. Climate at a glance: divisional time series temperature. Published October 2021. [accessed 2023 Oct 09]. https://www.ncdc.noaa.gov/cag/divisional/time-series.

National Oceanic and Atmospheric Administration National Centers for Environmental information. (NOAA NCEI) 2023. Climate at a glance: divisional time series. September 2023. [accessed 2023 Oct 09]. https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/divisional/time-series.

Ramaswamy V, Hurrell JW, Meehl GA. 2006. Why do temperatures vary vertically (from the surface to the stratosphere) and what do we understand about why they might vary and change over time? In: Temperature trends in the lower atmosphere: steps for understanding and reconciling differences. Karl TR, Hassol SJ, Miller CD, Murray WL (Eds.). A Report by the Climate Change Science Program and the Subcommittee on Global Change Research, Washington, DC. [accessed 2021 Nov 08]. https://downloads.globalchange.gov/sap/sap1-1/sap1-1-final-all.pdf.

Saha S, Moorthi S, Pan H, Wu X, Wang J, Nadiga S, Tripp P, Kistler R, Woollen J, Behringer D, Liu H, Stokes D, Grumbine R, Gayno G, Wang J, hou Y, Chuang H, Juang H, Sela J, Iredell M, Treadon R, Kleist D, Van Delst P, Keyser D, Derber J, Ek M, Meng J, Wei H, Yang R, Lord S, van den Dool H, Kumar A, Wang W, Long C, Chelliah M, Xue Y, Huang B, Schemm J, Ebisuzaki W, Lin R, Xie P, Chen M, Zhou S, Higgins W, Zou C, Liu Q, Chen Y, Han Y, Cucurull L, Reynolds R, Rutledge G, Goldberg M. 2010. The NCEP climate forecast system reanalysis. American Meteorology Society. [accessed 2023 Oct 09]. https://journals.ametsoc.org/doi/pdf/10.1175/2010BAMS3001.1.

Siedersleben SK, Lundquist JK, Platis A, Bange J, Bärfuss K, Lampert A, Cañadillas B, Neumann T, Emeis S. 2018. Micrometeorological impacts of offshore wind farms as seen in observations and simulations. Environ. Res. Lett. 13 (2018): 124012.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction & operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

United States Environmental Protection Agency (USEPA). 2023. Support center for regulatory atmospheric modeling (SCRAM): SCRAM Mixing Height Data. [accessed 2023 Nov 02]. https://www.epa.gov/scram/scram-mixing-height-data.

K.4.3. Appendix C

No references cited in Appendix C.

K.4.4. Appendix D

No references cited in Appendix D.

K.4.5. Appendix E

American Association of Port Authorities (AAPA). 2016. Port-related projects awarded $61.8 million in TIGER VIII infrastructure grants. [accessed 2022 Oct 20]. https://www.aapa-ports.org/advocating/PRDetail.aspx?ItemNumber=21393.

Atlantic States Marine Fisheries Commission (ASMFC). 2014. Five-year strategic plan 2014–2018. [accessed 2022 Oct 20]. http://www.asmfc.org/files/pub/2014-2018StrategicPlan_Final.pdf.

Atlantic States Marine Fisheries Commission (ASMFC). 2018. Management, policy and science strategies for adapting fisheries management to changes in species abundance and distribution resulting from climate change. February. [accessed 2019 Jan 7]. http://www.asmfc.org/files/pub/ClimateChangeWorkGroupGuidanceDocument_Feb2018.pdf.

Atlantic States Marine Fisheries Commission (ASMFC). 2019. Fisheries management. [accessed 2019 Aug 29]. http://www.asmfc.org/fisheries-management/program-overview.

Bureau of Ocean Energy Management (BOEM). 2013. General information: types of geological and geophysical surveys and equipment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 8 p.

Bureau of Ocean Energy Management (BOEM). 2016. Commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf Offshore New York. Revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS EIS/EA BOEM 2016-070.

Bureau of Ocean Energy Management (BOEM). 2018. Marine minerals: requests and active leases. [accessed 2021 Jul 10]. https://www.boem.gov/Requests-and-Active-Leases/.

Bureau of Ocean Energy Management (BOEM). 2019. National Environmental Policy Act documentation for impact-producing factors in the offshore wind cumulative impacts scenario on the North Atlantic outer continental shelf. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No. OCS Study BOEM 2019-036.

Bureau of Ocean Energy Management (BOEM). 2021a. Vineyard Wind Offshore Wind Energy Project: final environmental impact statement. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 352 p. Report No. BOEM 2021-0012.

Bureau of Ocean Energy Management (BOEM). 2021b. Submitted Atlantic OCS region permit requests. [accessed 2021 Aug 27]. https://www.boem.gov/submitted-atlantic-ocs-region-permit-requests.

Bureau of Ocean Energy Management (BOEM). 2021c. Commercial and research wind lease and grant issuance and associated site assessment activities on the Atlantic Outer Continental Shelf of New York Bight. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS EIS/EA BOEM 2021-073.

Capital Region Economic Development Council. 2018. Capital region creates 2018 progress report. [accessed 2018 Dec 18]. http://www.regionalcouncils.ny.gov/sites/default/files/2018-10/CapitalRegion2018ProgressReport.pdf.

Chinese V. 2018. East Hampton Town Board: Bigger towers present no danger. Newsday. Updated October 30, 2018. [accessed 2018 Dec 19]. https://www.newsday.com/long-island/suffolk/east-hampton-communication-towers-1.22630962.

City of New Bedford. 2010. A city master plan New Bedford 2020. [accessed 2018 Dec 18]. http://newbedford. wpengine.netdna-cdn.com/planning/wp-content/uploads/sites/46/NewBedford2020_ACityMasterPlan_2010.pdf.

Commonwealth of Massachusetts. 2015. 2015 update Massachusetts clean energy climate plan for 2020. [accessed 2019 Jan 19]. https://www.mass.gov/files/documents/2017/01/uo/cecp-for-2020.pdf.

Commonwealth of Massachusetts. 2016. Executive Order No. 569: establishing an integrated climate strategy for the Commonwealth. September 19, 2016. [accessed 2019 Jan 19]. https://www.mass.gov/files/documents/2017/01/uo/cecp-for-2020.pdf.

Commonwealth of Massachusetts. 2018a. Global warming solutions act: 10-year progress report. [accessed 2019 Jan 19]. https://www.mass.gov/files/documents/2019/01/17/GWSA-10-Year-Progress-Report.pdf.

Commonwealth of Massachusetts. 2018b. Massachusetts state hazard and climate adaptation plan. September 2018. [accessed 2019 Jan 17]. https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf.

Commonwealth of Massachusetts. 2019a. MVP program information. [accessed 2019 Jan 18]. https://www.mass.gov/service-details/mvp-program-information.

Commonwealth of Massachusetts. 2019b. Coastal resilience grant program. [accessed 2019 Jan 18]. https://www.mass.gov/service-details/coastal-resilience-grant-program.

Commonwealth of Massachusetts. 2020a. Massachusetts 2050 decarbonization roadmap. [accessed 2021 Oct 4]. https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.

Commonwealth of Massachusetts. 2020b. Request for comment on clean energy and climate plan for 2030. [accessed 2021 Oct 4]. https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download.

Commonwealth of Massachusetts. 2020c. Determination of statewide emissions limit for 2030. [accessed 2021 Oct 4]. https://www.mass.gov/doc/2030-ghg-emissions-limit-letter-of-determination/download.

Commonwealth of Massachusetts. 2020d. Determination of statewide emissions Limit for 2050. [accessed 2021 Oct 4]. https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download.

Commonwealth of Massachusetts Legislature. 2021. FY 2022 final budget. [accessed 2021 Oct 5]. https://malegislature.gov/Budget/FY2022/FinalBudget.

Connecticut General Assembly. 2019. An act authorizing municipal climate change and coastal resiliency reserve funds (Public Act No 19-77). [accessed 2021 Oct 5]. https://www.cga.ct.gov/2019/ACT/pa/pdf/2019PA-00077-R00SB-01062-PA.pdf.

Connecticut General Assembly. 2021. An act concerning climate change adaptation (Public Act 21-115). [accessed 2021 Oct 5]. https://cga.ct.gov/2021/ACT/PA/PDF/2021PA-00115-R00HB-06441-PA.pdf.

Connecticut Institute for Resilience & Climate Adaptation (CIRCA). 2021. CIRCA's resilient Connecticut project. [accessed 2021 Oct 5]. https://resilientconnecticut.uconn.edu/wp-content/uploads/sites/2761/2021/05/CIRCA-RC-fact-sheet2021.pdf. Accessed October 5, 2021.

Connecticut Port Authority (CPA). 2018a. Connecticut maritime strategy. [accessed 2018 Nov 1]. https://ctportauthority.com/wp-content/uploads/2018/08/Connecticut-Maritime-Strategy-2018.pdf.

Connecticut Port Authority (CPA). 2018b. CPA begins evaluation of RFP response for state pier. [accessed 2018 Nov 1]. https://ctportauthority.com/about-us/in-the-news/.

Connecticut Port Authority (CPA). 2023. State pier infrastructure improvements project. Project details. [accessed 2023 Aug 08]. https://statepiernewlondon.com/#project-details.

Cooper J. 2019. CT wind energy producer add $45M to New London state pier upgrade. HBJ. [accessed 2020 Jan 24]. https://www.hartfordbusiness.com/article/ct-wind-energy-producer-add-45m-to-new-london-state-pier-upgrade.

DockNYC. 2018. South Brooklyn marine terminal (SBMT). [accessed 2018 Dec 20]. http://docknyc.com/sites-locations/brooklyn/south-brooklyn-marine-terminal-sbmt/.

Epsilon Associates, Inc. 2018. Draft construction and operations plan. Vineyard Wind Project. October 22, 2018. [accessed 2018 Nov 4]. https://www.boem.gov/Vineyard-Wind/.

Federal Aviation Administration (FAA). 2020. Advisory circular 70/7460-1M obstruction marking and lighting. [accessed 2023 Aug 07]. https://www.faa.gov/documentLibrary/media/Advisory_Circular/Advisory_Circular_70_7460_1M.pdf.

Federal Energy Regulatory Commission (FERC). 2012a. Environmental assessment for hydropower project pilot license. Cobscook Bay tidal energy project—FERC project number 12711-005 (DOE/EA1916). [accessed 2018 Oct 30]. https://www.energy.gov/sites/prod/files/EA-1916-DEA-2011.pdf.

Federal Energy Regulatory Commission (FERC). 2012b. Order issuing project pilot license. Verdant Power, LLC. Project number 12611-005. [accessed 2018 Oct 30]. https://www.ferc.gov/media/news-releases/2012/2012-1/01-23-12-order.pdf?csrt=4969462846396361735.

Federal Energy Regulatory Commission (FERC). 2021. Website for liquefied natural gas with listings for existing, approved, and proposed LNG import/export terminals. [accessed 2021 Aug 27]. https://www.ferc.gov/natural-gas/overview/lng.

Governor's Office. 2017a. 2017 State of the state. [accessed 2019 Jan 9]. https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/2017StateoftheStateBook.pdf.

Governor's Office. 2017b. Governor Cuomo announces historic $5.6 billion transformation of the Long Island Railroad. July 19, 2017. [accessed 2018 Dec 19]. https://www.liherald.com/stories/cuomo-announces-56b-plan-to-upgrade-the-lirr,94112.

Governor's Office. 2018a. Governor Cuomo and Attorney General Schneiderman file petition with federal government to set fair fluke quota. March 23. [accessed 2019 Jan 7]. https://www.governor.ny.gov/news/governor-cuomo-and-attorney-general-schneiderman-file-petition-federal-government-set-fair.

Governor's Office. 2018b. Governor Cuomo announces dramatic increase in energy efficiency and energy storage targets to combat climate change. December 13. [accessed 2019 Jan 9]. https://www.governor.ny.gov/news/governor-cuomo-announces-dramatic-increase-energy-efficiency-and-energy-storage-targets-combat.

Governor's Office. 2018c. 2018 state of the state. [accessed 2019 Jan 9]. https://www.governor.ny.gov/sites/governor.ny. Gov/files/atoms/files/2018-stateofthestatebook.pdf.

Governor's Office. 2021. Governor Hochul announces $600 million in grants available for water infrastructure and resiliency projects statewide, outlines new resilient New York agenda. [accessed 2021 Oct 5]. https://www.governor.ny.gov/news/governor-hochul-announces-600-million-grants-available-water-infrastructure-and-resiliency.

Hare JA, Morrison WE, Nelson MW, Stachura MM, Teeters EJ, Griffis RB. 2016. A vulnerability assessment of fish and invertebrates to climate change on the Northeast U.S. Continental Shelf. PloS ONE 11(2): e0146756.

Interface Studio. 2019. Town of North Kingstown comprehensive plan 2019—10-year re-write. [accessed 2021 Oct 5]. https://www.northkingstown.org/DocumentCenter/View/3282/North-Kingstown-Comprehensive-Plan-September-2019-FINAL-REV.

Intergovernmental Panel on Climate Change (IPCC). 2018. IPCC special report on impacts of global warming of 1.5 degrees Celsius above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty: summary for policymakers. [accessed 2018 Nov 5]. http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

Kuffner A. 2018. Deepwater Wind to invest $250 million in Rhode Island to build utility-scale offshore wind farm. Providence Journal. [accessed 2018 Nov 4]. http://www.providencejournal.com/news/20180530/deepwater-wind-to-invest-250-million-in-rhode-island-to-build-utility-scale-offshore-wind-farm.

Long Island Regional Development Council (LIRDC). 2018. Long Island completing the puzzle 2018 update. http://regionalcouncils.ny.gov/sites/default/files/2018-10/LongIsland 2018REDCReport_0.pdf. Accessed December 20, 2018.

Marine Renewable Energy Collaborative (MRECo). 2017. New England Marine Energy Development System (NEMEDS) brochure. [accessed 2018 Oct 30]. https://www.mreconewengland.org/ marine_renewable_energy/wp-content/uploads/2017/08/MRECo_Testing_Facilities_v2017.pdf.

Marine Renewable Energy Collaborative (MRECo). 2018. Bourne tidal test site brochure. [accessed 2018 Oct 30]. https:/www.mreconewengland.org/marine_renewable_energy/wp-content/uploads/2017/12/BrochurewithCompletedStructure.pdf.

Massachusetts Clean Energy Center (MassCEC). 2017a. Massachusetts offshore wind ports & infrastructure assessment: Montaup power plant site – Somerset. [accessed 2018 Nov 4]. http://files.masscec.com/Montaup%20Power%20Plant%201.pdf.

Massachusetts Clean Energy Center (MassCEC). 2017b. Massachusetts offshore wind ports & infrastructure assessment: Brayton Point power plant site – Somerset. [accessed 2018 Nov 4]. http://files.masscec.com/Brayton%20Point%20Power%20Plant.pdf.

Massachusetts Clean Energy Center (MassCEC). 2017c. Massachusetts Clean Energy Center announces port assessment for offshore wind industry in Massachusetts. [accessed 2018 Nov 4]. https://www.masscec.com/about-masscec/news/massachusetts-clean-energy-center-announces-port-assessment-offshore-wind.

Massachusetts Clean Energy Center (MassCEC). 2018. New Bedford Marine Commerce Terminal. [accessed 2018 Nov 4]. https://www.masscec.com/facilities/new-bedford-marine-commerce-terminal.

Massachusetts Department of Environmental Protection (MassDEP). 2017. Air quality plan approval. [accessed 2018 Nov 5]. https://eeaonline.eea.state.ma.us/EEA/FileService/FileService. Download/file/AQPermit/dgjdgdbe.

Metropolitan Transit Authority (MTA). 2017. Governor Cuomo proposes $120 million to enhance 16 LIRR stations and improve system connectivity with MacArthur Airport and Brookhaven National Laboratory. January 10. [accessed 2019 Dec 19]. http://www.mta.info/news/2017/01/10/governor-cuomo-proposes-120-million-enhance-16-lirr-stations-and-improve-system.

Mid-Atlantic Fishery Management Council (MAFMC). 2019. About the council. [accessed 2019 Jan 8]. http://www.mafmc.org/about/.

Minerals Management Service (MMS). 2007. Programmatic environmental impact statement for alternative energy development and production and alternate use of facilities on the Outer Continental Shelf, final environmental impact statement, October 2007. OCS EIS/EA MMS 2007-046. [accessed 2021 Nov 30]. https://www.boem.gov/renewable-energy/guide-ocs-alternative-energy-final-programmatic-environmental-impact-statement-eis.

National Marine Fisheries Service (NMFS). 2013. Endangered Species Act Section 7 consultation biological opinion for commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf in Massachusetts, Rhode Island, New York and New Jersey wind energy areas. NER- 2012-9211.

National Marine Fisheries Service (NMFS). 2021. Landings and revenue data for wind energy areas. [accessed 2022 Aug 7]. https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/WIND/ALL_WEA_BY_AREA_DATA.html.

New Bedford Port Authority. 2022. Revolution Wind Farm and Revolution Wind Export Cable Project draft environmental impact statement comment letter submitted to BOEM. October 17, 2022.

New England Fishery Management Council (NEFMC). 2016. Omnibus Essential Fish Habitat Amendment 2, Volume 6: cumulative effects, compliance with applicable law and references. [accessed 2018 Oct 30]. https://s3.amazonaws.com/nefmc.org/OA2-FEIS_Vol_6_FINAL_170303.pdf.

New Jersey Division of Fish and Wildlife. 2021.Proposal number PRN 2021-019. [accessed 2022 Nov 11]. https://www.nj.gov/dep/rules/proposals/20210301b.pdf.

New York City Economic Development Corporation. 2018. New York works: NYCDC announces transformation of South Brooklyn maritime shipping hub, creating over 250 jobs in the near-term. May 8, 2018. [accessed 2018 Dec 19]. https://www.nycedc.com/press-release/new-york-works-nycedc-announces-transformation-south-brooklyn-maritime-shipping-hub.

New York State. 2014. Reforming the energy vision. [accessed 2019 Feb 24]. https://rev.ny.gov/.

New York State Department of Environmental Conservation (NYSDEC). 2017. New York ocean action plan 2017-2027. [accessed 2019 Jan 13]. https://www.dec.ny.gov/docs/fish_marine_pdf/nyoceanactionplan.pdf.

New York State Department of Environmental Conservation (NYSDEC). N.d. [2019]. Community risk and resiliency act (CRRA). [accessed 2019 Jan 17]. https://www.dec.ny.gov/energy/102559.html.

New York State Energy Research and Development (NYSERDA). 2015. Clean energy plan. [accessed 2019 Jan 5]. https://energyplan.ny.gov/-/media/nysenergyplan/2015-state-energy-plan.pdf.

New York State Energy Research and Development (NYSERDA). 2017a. Biennial report to the 2015 state energy plan. [accessed 2019 Feb 1]. https://energyplan.ny.gov/-/media/nysenergyplan/2017-BiennialReport-printer-friendly.pdf.

New York State Energy Research and Development (NYSERDA). 2017b. New York State offshore wind master plan. NYSERDA Report 17-25b. [accessed 2018 Dec 20]. https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-New-York-State-Overview/NYS-Offshore-Wind-Master-Plan.

Northeast Regional Planning Body (NRPB). 2016. Northeast ocean plan: full plan. [accessed 2018 Aug 30]. https://neoceanplanning.org/wp-content/uploads/2018/01/Northeast-Ocean-Plan_Full.pdf.

Phillips J. 2018. $15 million grant awarded to Port of New Bedford. 1420 WBSM. Published December 6, 2018. [accessed 2019 Apr 1]. https://wbsm.com/15-million-grant-awarded-to-port-of-new-bedford/.

Port of Davisville. 2017. Port of Davisville factsheet. [accessed 2018 Nov 1]. https://commerceri.com/wp-content/uploads/2018/04/POD_Insert_2017_rev1.pdf.

Port of New Bedford. 2018. Draft New Bedford Port Authority strategic plan 2018–2023. [accessed 2018 Nov 4]. http://www.portofnewbedford.org/NBPA%20Draft%20Strategic%20Plan.pdf.

Port of New Bedford. 2020. Website for Port of New Bedford: offshore wind. [accessed 2020 Jan 24]. https://portofnewbedford.org/offshore-wind/.

Rhode Island Coastal Resources Management Council (RICRMC). 2010. Rhode Island Ocean Special Area Management Plan (SAMP), volumes 1 and 2. Prepared for the Coastal Resources Management Council. Providence, Rhode Island. Coastal Resources Center, University of Rhode Island, Narragansett, Rhode Island.

Rhode Island Coastal Resources Management Council (RICRMC). 2018a. CRMC funds nine habitats restoration projects. [accessed 2019 Apr 01]. http://www.crmc.ri.gov/news/2018_0326_habrest.html.

Rhode Island Coastal Resources Management Council (RICRMC). 2018b. Rhode Island shoreline change special area management plan. June. [accessed 2019 Jan 18]. http://www.crmc.ri.gov/samp_beach /SAMP_Beach.pdf.

Rhode Island Coastal Resources Management Council (RICRMC). 2022. CRMC funds five habitat restoration projects. [accessed 2022 Jul 16]. http://www.crmc.ri.gov/news/2022_0308_habrest.html.

Rhode Island Governor's Office. 2018. Press release: Raimondo, Deepwater Wind announce 800+ jobs. [accessed 2018 Nov 04]. https://www.ri.gov/press/view/33345.

Rhode Island Office of Energy Resources (OER). 2020. The road to 100% renewable electricity by 2030 in Rhode Island. [accessed 2021 Oct 04]. http://www.energy.ri.gov/documents/renewable/The%20Road%20to%20100%20Percent%20Renewable%20Electricity%20-%20Brattle%2004Feb2021.pdf.

Rulison L. 2018. Port of Albany Plans Giant Warehouse in Bethlehem. Times union. Published August 24, 2018. [accessed 2018 Dec 20]. https://www.timesunion.com/business/article/Port-of-Albany-plans-giant-warehouse-in-Bethlehem-13180505.php.

Sheridan T. 2019. Southeastern Connecticut unfurls its sails. The Day. Published May 12, 2019. [accessed 2020 Feb 12]. https://www.theday.com/op-edguest-opinions/20190512/southeastern-connecticut-unfurls-its-sails.

State of Connecticut. 2008. An act concerning Connecticut global warming solutions (Public Act No. 08-98). [accessed 2021 Oct 04]. http://www.cga.ct.gov/2008/ACT/PA/2008PA-00098-R00HB-05600-PA.htm.

State of Connecticut. 2018a. Building a low carbon future for Connecticut: achieving a 45% GHG reduction by 2030. [accessed 2021 Oct 04]. https://portal.ct.gov/-/media/DEEP/climatechange/publications/BuildingaLowCarbonFutureforCTGC3Recommendationspdf.pdf.

State of Connecticut. 2018b. An act concerning climate change planning and resiliency (Public Act No. 18-82). [accessed 2021 Oct 04]. https://www.cga.ct.gov/2018/ACT/pa/pdf/2018PA-00082-R00SB-00007-PA.pdf.

State of Connecticut. 2018c. 2018 Connecticut comprehensive energy strategy. [accessed 2021 Oct 04]. https://portal.ct.gov/-/media/DEEP/energy/CES/2018ComprehensiveEnergyStrategypdf.pdf.

State of Connecticut. 2019. Executive order no. 3. [accessed 2021 Oct 04]. https://portal.ct.gov/-/media/Office-of-the-Governor/Executive-Orders/Lamont-Executive-Orders/Executive-Order-No-3.pdf?la=en&hash=F836ED64F1BB49A5424AB4C7493A3AE3.

State of Connecticut. 2020. Draft integrated resources plan. [accessed 2021 Oct 04]. https://portal.ct.gov/-/media/DEEP/energy/IRP/2020-IRP/2020-CT-DEEP-Draft-Integrated-Resources-Plan-in-Accordance-with-CGS-16a-3a.pdf.

State of Connecticut. 2021. Taking action on climate change and building a more resilient Connecticut for all. [accessed 2021 Oct 04]. https://portal.ct.gov/-/media/DEEP/climatechange/GC3/GC3_Phase1_Report_Jan2021.pdf.

State of New York Public Service Commission. 2016. Order adopting a clean energy standard. 8/1/2016. [accessed 2019 Jan 29] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7b44C5D5B8-14C3-4F32-8399-F5487D6D8FE8%7d.

State of Rhode Island. 2014. Chapter 42-62 Resilient Rhode Island Act of 2014- climate change coordinating council. [accessed 2019 Jan 17] http://webserver.rilin.state.ri.us/Statutes/TITLE42/42-6.2/INDEX.HTM.

State of Rhode Island. 2015a. Executive Order 15-17. State agencies to lead by example in energy efficiency and clean energy. December 8. [accessed 2019 Jan 17]. http://www.governor.ri.gov/documents/orders/ExecOrder15-17.pdf.

State of Rhode Island. 2015b. Energy 2035 Rhode Island state energy plan. October 8. [accessed 2019 Jan 17]. http://www.planning.ri.gov/documents/LU/energy/energy15.pdf.

State of Rhode Island. 2016. Rhode Island greenhouse gas emissions reduction plan. December. [accessed 2019 Jan 17]. http://climatechange.ri.gov/documents/ec4-ghg-emissions-reduction-plan-final-draft-2016-12-29-clean.pdf.

State of Rhode Island. 2017. Executive Order 17-06. Rhode Island's commitment to the principles of the Paris climate agreement. June 12. [access 2019 Jan 17]. http://www.governor.ri.gov/documents/orders/ExecOrder_17-06_06112017.pdf.

State of Rhode Island. 2018a. Governor's climate priorities. [accessed 2019 Jan 17]. http://climatechange.ri.gov/state-actions/governor-climate-priorities.php.

State of Rhode Island. 2018b. Resilient Rhody: an actionable vision for addressing the impacts of climate change in Rhode Island. [accessed 2021 Feb 10]. http://climatechange.ri.gov/documents/resilientrhody18.pdf.

State of Rhode Island. 2020a. Executive Order 20-01: Advancing a 100% renewable energy future for Rhode Island by 2030. [accessed 2021 Oct 04]. https://governor.ri.gov/sites/g/files/xkgbur236/files/2021-06/Executive-Order-20-01.pdf.

State of Rhode Island. 2020b. 2021 Act on climate. [accessed 2021 Oct 04]. http://webserver.rilin.State.ri.us/ BillText/BillText21/HouseText21/H5445.pdf.

State of Rhode Island. 2021. State transportation improvement program (STIP) 2022-2031. [accessed 2021 Oct 05]. http://www.planning.ri.gov/planning-areas/transportation/tip-2022-2031.php.

Suffolk County. 2015. Suffolk County comprehensive master plan 2035. [accessed 2018 Dec 01]. http://www.suffolkcountyny.gov/Departments/Planning/SpecialProjects/ComprehensivePlan/DownloadPlan.aspx.

Town and County of Nantucket. 2018a. Project and developments website. [accessed 2018 Sep 01]. https://www.nantucket-ma.gov/1121/Projects-and-Developments.

Town and County of Nantucket. 2018b. Coastal resiliency on Nantucket: coastal resilience plan. [accessed 2018 Sep 01]. https://www.nantucket-ma.gov/2030/Coastal-Resilience-Plan.

Town of North Kingstown. 2008. North Kingstown comprehensive plan 2008 5-year update. October 20. [accessed 2019 Jan 19]. https://www.northkingstown.org/DocumentCenter/View/382/North-Kingstown-Comprehensive-Plan-PDF.

United States Army Corps of Engineers (USACE). 2018a. Corps proposes improvement dredging for Point Judith Harbor Federal Navigation Project in Narragansett. Published Sept. 19, 2018. [accessed 2019 Mar 28]. https://www.nae.usace. Army.mil/Media/News-Releases/Article/1639371/corps-proposes-improvement-dredging-for-point-judith-harbor-federal-navigation/.

United States Army Corps of Engineers (USACE). 2018b. Construction tentatively scheduled to start in November 2018: Corps awards contract to dredge Plymouth Harbor Federal navigation project in Plymouth. [accessed 2019 Apr 01]. https://www.nae.usace.army.mil/Media/News-Releases/Article/1652045/construction-tentatively-scheduled-to-start-in-november-2018-corps-awards-contr/.

United States Army Corps of Engineers (USACE). 2018c. Public comments on New Haven Harbor Improvement EIS study due to Corps of Engineers by Nov. 15. Published Nov. 2, 2018. [accessed

2019 Apr 01]. https://www.nae.usace. Army.mil/Media/News-Releases/Article/1680678/public-comments-on-new-haven-harbor-improvement-eis-study-due-to-corps-of-engin/.

United States Army Corps of Engineers (USACE). 2018d. Town of Dennis seeks Corps permit to dredge in Dennis, Yarmouth; dispose of material. [accessed 2019 Apr 01]. https://www.nae.usace.army.mil/ Media/News-Releases/Article/1560611/town-of-dennis-seeks-corps-permit-to-dredge-in-dennis-yarmouth-dispose-of-mater/.

United States Army Corps of Engineers (USACE). 2018e. Ocean dredged material disposal site database. [accessed 2018 Oct 31]. https://odd.el.erdc.dren. Mil/ODMDSSearch.cfm.

United States Army Corps of Engineers (USACE). 2018f. Fire Island Inlet to Montauk Point (FIMP) project. [accessed 2018 Dec 18]. https://www.nan.usace.army.mil/Missions/Civil-Works/Projects-in-New-York/Fire-Island-to-Montauk-Point-Reformulation-Study/.

United States Army Corps of Engineers (USACE). 2018g. Proposed plan summary. Former NIKE Battery PR-58 and Disaster Village Training Area (DVTA) former used defense site. North Kingstown, Rhode Island. March 8. [accessed 2018 Dec 21]. http://www.quonset.com/_resources/common/userfiles/file/Public%20Notices/Final_Nike_PR58_PPMeeting_030818.pdf.

United States Army Corps of Engineers (USACE). 2019. The Nature Conservancy seeks permit to place artificial reef array in Narragansett Bay in East Providence. [accessed 2019 Apr 01]. https://www.nae.usace.army.mil/Media/News-Releases/Article/1742478/the-nature-conservancy-seeks-permit-to-place-artificial-reef-array-in-narragans/.

United States Department of Transportation (USDOT) Maritime Administration (MARAD). 2021. Marine highway projects description. [accessed 2021 Aug 26]. https://www.maritime.dot.gov/sites/marad.dot.gov/files/2021-02/AMH%20Project%20Designations%20Jan%202021_0.pdf.

United States Department of Transportation (USDOT) Maritime Administration (MARAD). 2022. America's marine highways, grants. [accessed 2023 May 25]. https://maritime.dot.gov/grantsfinances/marine-highways/grants.

United States Geological Survey (USGS). 2018. The U.S. wind turbine database (USWTDB_V1_1_20180710). [accessed Aug 2018]. https://eerscmap.usgs.gov/uswtdb/.

Utility Dive. 2018. There once was an energy storage system on Nantucket. Published January 17, 2018. [accessed 2018 Nov 5]. https://www.utilitydive.com/news/there-once-was-an- energy-storage-system-on-nantucket/513650/.

The White House. 2020a. Memorandum on the withdrawal of certain areas of the United States Outer Continental Shelf from leasing disposition. [accessed 2020 Sept 25]. https://www.whitehouse.gov/ presidential-actions/memorandum-withdrawal-certain-areas-united-states-outer-continental-shelf-leasing-disposition/.

The White House. 2020b. Presidential determination on the withdrawal of certain areas of the United States Outer Continental Shelf from leasing disposition. [accessed 2020 Oct 8}.

https://www.whitehouse.gov/presidential-actions/presidential-determination-withdrawal-certain-areas-united-states-outer-continental-shelf-leasing-disposition/.

Verdant Power. 2018. RITE Project – FERC No. P-12611. [accessed 2018 Dec 21]. https://www.verdantpower.com/rite.

Vineyard Wind. 2019. Vineyard Wind announces grant to New Bedford Port Authority to advance offshore wind industry. November 25. [accessed 2020 Jan 24]. https://www.vineyardwind.com/press-releases/2019/11/25/vineyard-wind-announces-grant-to-new-bedford-port-authority-to-advance-offshore-wind-industry.

Washington County Regional Planning Council. 2012. Washington County transfer of development rights study: final report. [accessed 2021 Oct 5]. http://wcrpc.org/storage/WCRPC_TDR_Final%20Report_10-09-12.pdf.

K.4.6. Appendix F

Bureau of Ocean Energy Management (BOEM). 2015. Virginia Offshore Wind Technology Advancement Project on the Atlantic Outer Continental Shelf Offshore Virginia: revised environmental assessment. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS EIS/EA BOEM 2015-031.

Bureau of Ocean Energy Management (BOEM). 2021. South Fork Wind Farm and South Fork Export Cable Project final environmental impact statement. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS EIS/EA BOEM 2020-057.

Bureau of Ocean Energy Management (BOEM). 2022. Sunrise Wind Farm biological assessment for National Marine Fisheries Service. https://www.boem.gov/renewable-energy/state-activities/sunrise-wind.

Guida V, Drohan A, Welch H, McHenry J, Johnson D, Kentner V, Brink J, Timmons D, Estela-Gomez E. 2017. Habitat mapping and assessment of Northeast wind energy areas. Sterling, VA: U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2017-088. [updated 2013 Nov 01]. Prepared in Collaboration between Gulf of Maine Research Institute and University of Maine.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE. 2020. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2019. NOAA Tech Memo NMFS-NE 264.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE, Turek J. 2021. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments – 2020. NOAA Tech Memo NMFS-NE 271.

Hutchison ZL, Secor DH, Gill AB. 2020. The interaction between resource species and electromagnetic fields associated with electricity production by offshore wind farms. Oceanography 33(4):96–107.

Inspire Environmental (Inspire). 2022. Benthic habitat mapping to support essential fish habitat consultation. Appendix M3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

National Oceanic and Atmospheric Administration (NOAA). 2020. Section 7 effect analysis: turbidity in the Greater Atlantic Region. NOAA Greater Atlantic Regional Fisheries Office. [accessed 2021 Nov 11]. https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-effect-analysis-turbidity-greater-atlantic-region.

Normandeau Associates, Inc. (Normandeau), Exponent Inc., Tricas T, Gill A. 2011. Effects of EMFs from undersea power cables on elasmobranchs and other marine species. Camarillo, California: U.S. Department of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region. OCS Study BOEM 2011-09.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Petersen Lk, Christensen TK, Kahlert J, Desholm M, Fox AD. 2006. Final results of bird studies at the offshore wind farms at Nysted and Horns Rev, Denmark. National Environmental Research Institute, Ministry of the Environment, Denmark. [accessed 2020 Sep 01]. https://tethys.pnnl.gov/sites/default/files/publications/NERI_Bird_Studies.pdf.

Skov H, Heinanen S, Norman T, Ward RM, Mendez-Roldan S, Ellis I. 2018. ORJIP bird collision and avoidance study. Final report. The Carbon Trust: United Kingdom.

Southall BL, Bowles AE, Ellison WT, Finneran JJ, Gentry RL, Greene. CR Jr., Tyack PL. 2007. Marine mammal noise exposure criteria: initial scientific recommendations. Aquatic Mammals 33(4):411–521.

Southall BL, Nowacek DP, Bowles AE, Senigaglia V, Bejder L, Tyack PL. 2021. Marine mammal noise exposure criteria: assessing the severity of marine mammal behavioral responses to human noise. Aquatic Mammals 47(5):421–464.

Taormina B, Bald J, Want A, Thouzeau G, Lejart M, Desroy N, Carlier A. 2018. A review of potential impacts of submarine power cables on the marine environment: knowledge gaps, recommendations and future directions. Renewable and Sustainable Energy Reviews 96: 380–391.

United States Coast Guard (USCG). 2020. The areas offshore of Massachusetts and Rhode Island port access route study. USCG 2019-0131. [updated 2020 May 14; accessed 2021 Oct 13]. https://www.navcen.uscg.gov/pdf/PARS/FINAL_REPORT_PARS_May_14_2020.pdf.

K.4.7. Appendix G

Bedore CN, Kajiura SM. 2013. Bioelectric fields of marine organisms: voltage and frequency contributions to detectability by electroreceptive predators. Physiological and Biochemical Zoology 86(3):298–311.

Department of the Navy (DoN). 2017. Criteria and thresholds for U.S. Navy acoustic and explosive effects analysis (Phase III). Technical report. U.S. Department of the Navy, Space and Naval Warfare Systems Center Pacific.

National Marine Fisheries Service (NMFS). 2018. 2018 Revision to: Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (Version 2.0). Underwater acoustic thresholds for onset of permanent and temporary threshold shifts. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. NOAA Technical Memorandum NMFS-OPR-59.

Washington State Department of Transportation (WSDOT). 2020. Construction noise impact assessment. In biological assessment preparation manual. August. Available at: https://wsdot.wa.gov/sites/default/files/2018/01/18/Env-FW-BA_ManualCH07.pdf. Accessed December 7, 2020.

Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol SM, Carlson T, Coombs S, Ellison WT, Gentry RL, Halvorsen M, Lokkeborg S, Rogers PH, Southall B, Zeddies DG, Tavolga WN. 2014. Sound exposure guidelines. ASA S3/SC1.4 TR-2014 sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. Springer Briefs in Oceanography. Springer, Cham.

K.4.8. Appendix H

Bureau of Ocean Energy Management (BOEM). 2019. Guidelines for providing benthic habitat survey information for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR part 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 9 p.

Bureau of Ocean Energy Management (BOEM). 2019. Guidelines for providing information on fisheries for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR Part 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 14 p.

Bureau of Ocean Energy Management (BOEM). 2022. BOEM's Draft guidelines for mitigating impacts to commercial and recreation fisheries on the outer continental shelf pursuant to 30 CFR § 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs.12 p.

Bureau of Ocean Energy Management (BOEM). 2021. Guidelines for providing information on lighting and marking of structures supporting renewable energy development. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 9 p.

Federal Aviation Administration (FAA). 2018. Advisory circular 70/7460-1L obstruction marking and lighting. [accessed 2023 Aug 07]. https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_70_7460-1L_-_Obstuction_Marking_and_Lighting_-_Change_2.pdf.

LGL Ecological Research Associates, Inc (LGL Ecological Research Associates). 2022. Protected species mitigation and monitoring plan: sea turtles and ESA-listed fish species. Appendix O3 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. July 2022.

National Oceanic and Atmospheric Administration- Fisheries (NOAA Fisheries). 2018. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. National Oceanic and Atmospheric Administration, Department of Commerce. [accessed 2023 Nov 12]. https://www.fisheries.noaa.gov/resource/document/technical-guidance-assessing-effects-anthropogenic-sound-marine-mammal-hearing.

Ørsted Offshore North America. 2021. Fisheries communication and outreach plan. Appendix B in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. October 2021.

Sunrise Wind LLC (Sunrise Wind). 2022a. Fisheries and benthic monitoring plan. Appendix AA1 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC (Sunrise Wind). 2022b. Draft protected species mitigation and monitoring plan. Appendix O2 in Construction and Operations Plan Sunrise Wind Farm. April 2022. Submitted to National Marine Fisheries Service.

Sunrise Wind LLC (Sunrise Wind). 2022c. Petition for incidental take regulations for the construction and operation of the Sunrise Wind Offshore Wind Farm. May 2022. Prepared for Sunrise Wind LLC by LGL Ecological Research Associates, Inc. Submitted to National Marine Fisheries Service, Office of Protected Resources.

Sunrise Wind LLC (Sunrise Wind). 2022d. Sunrise Wind benthic monitoring plan – New York State waters. Appendix AA2 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC (Sunrise Wind). 2023a. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sunrise Wind LLC (Sunrise Wind). 2023b. Cultural resources avoidance, minimization, and mitigation measures - confidential. Appendix Z in Construction and Operations Plan Sunrise Wind Farm. March 2023.

United States Fish and Wildlife Service (USFWS). 2022. Range-wide Indiana bat and northern long-eared bat survey guidelines [accessed 2023 Jul 10]. https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

Van Parijs SM, Baker K, Carduner J, Daly J, Davis GE, Esch C, Guan S, Scholik-Schlomer A, Sisson NB, Staaterman E. 2021. NOAA and BOEM minimum recommendations for use of passive acoustic listening systems in offshore wind energy development monitoring and mitigation programs. Frontiers in Marine Science 8(1575).

K.4.9. Appendix I

Bureau of Ocean Energy Management (BOEM). 2016. The identification of port modifications and their environmental and socioeconomic consequences. Washington, DC: U.S. Department of the Interior, Bureau of Ocean Energy Management. 238 p. OCS BOEM Study 2016-034.

Bureau of Ocean Energy Management (BOEM). 2021. Assessment of seascape, landscape, and visual impacts of offshore wind developments on the outer continental shelf of the United States. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2021-032.

Bureau of Ocean Energy Management (BOEM). 2022. Ocean Wind 1 Offshore Wind Farm draft environmental impact statement. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS EIS/EA BOEM 2022-021.

Cape Cod Commission. 2012. Technical Bulletin #12-001 Visual Impact Assessment Methodology for Offshore Development. [accessed 2023 Nov 11]. https://blmwyomingvisual.anl.gov/docs/Cape_Cod_VIA_Methodology.pdf.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2022a. Offshore visual impact assessment. Appendix Q1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. November 2022.

Environmental Design & Research (EDR). 2022b. Response to BOEM Request for Information, dated February 2, 2022.

Environmental Design & Research (EDR). 2023. Response to BOEM Request for Information, dated June 7, 2023.

Landscape Institute and Institute of Environmental Management and Assessment. 2016. Guidelines for landscape and visual impact assessment. Third edition.

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sullivan RG, Kirchler LB, Cothren J, Winters SL. 2013. Offshore wind turbine visibility and visual impact threshold distances. Environ Pract. 15(1):33–49.

Terrence J. DeWan & Associates Landscape Architects and Planners (TJD&A). 2021. Ocean Wind offshore wind farm construction and operation plan: Appendix L. Visual Impact Assessment. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/OCW01_COP_Volume%20III_PUBLIC_202300518.pdf.

K.4.10. Appendix J

No references cited in Appendix J.

K.4.11. Appendix L

No references cited in Appendix L.

K.4.12. Appendix M

No references cited in Appendix M.

K.4.13. Appendix N

No references cited in Appendix N.

K.4.14. Appendix O

AKRF Inc., AECOM, Popper A. 2012. Essential fish habitat assessment for the Tappan Zee Hudson River Crossing Project, Rockland and Westchester Counties, New York and the Historic Area Remediation Site, New York Bight Apex.

Brooks RA, Purdy CN, Bell SS, Sulak KJ. 2006. The benthic community of the Eastern U.S. continental shelf: a literature synopsis of benthic faunal resources. Continental Shelf Research 26:804-818.

Bureau of Ocean Energy Management (BOEM). 2015. Virginia offshore wind technology advancement project on the Atlantic outer continental shelf offshore Virginia revised environmental assessment. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No. BOEM 2015-031.

Bureau of Ocean Energy Management (BOEM). 2019. Guidelines for providing benthic habitat survey information for renewable energy development on the Atlantic outer continental shelf pursuant to 30 CFR part 585. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. 9 p.

Bureau of Ocean Energy Management (BOEM). 2021. Project design criteria and best management practices for protected species associated with offshore wind data collection. [revised 2022 Nov 11; accessed 2023 Nov 21]. https://www.boem.gov/sites/default/files/documents/PDCs %20and%20BMPs %20for%20Atlantic%20Data%20Collection%2011222021.pdf.

Carey DA, Wilber DH, Read LB, Guarinello ML, Griffin M, Sabo S. 2020. Effects of the Block Island Wind Farm on coastal resources: lessons learned. Oceanography 33(4):70-81. Chen L, Coolen JWP, Scherer L, Mogollón JM, Braeckman U, Vanaverbeke J, Tukker A, Steubing B. 2023. Offshore wind energy and marine biodiversity in the North Sea: life cycle impact assessment for benthic communities. Environmental Science & Technology 57 (16): 6455-6464.

Chen L, Coolen JWP, Scherer L, Mogollón JM, Braeckman U, Vanaverbeke J, Tukker A, Steubing B. 2023. Offshore wind energy and marine biodiversity in the North Sea: life cycle impact assessment for benthic communities. Environmental Science & Technology 57 (16): 6455-6464.

Christiansen N, Daewel U, Schrum C. 2022. Tidal mitigation of offshore wind wake effects in coastal seas. Front. Mar. Sci. 9:1006647.

Confluence (Confluence Environmental Company). 2023. Revolution Wind Farm and Revolution Wind Export Cable – development and operation. Essential fish habitat assessment. Prepared for BOEM. Washington, D.C.

Council on Environmental Quality (CEQ) and Advisory Council on Historic Preservation (ACHP). 2013. NEPA and NHPA: a handbook for integrating NEPA and section 106. [accessed 2022 Jun 09]. https://www.achp.gov/digital-library-section-106-landing/nepa-and-nhpa-handbook-integrating-nepa-and-section-106.

Daewel U, Akhtar N, Christiansen N, Schrum C. 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Communications Earth & Environment 3(292).

Dean M, DeCelles G, Zemeckis D, Ames T. 2020. Early life history. In: an interdisciplinary review of Atlantic cod (*Gadus morhua*) stock structure in the Western North Atlantic Ocean. McBride RS, Smedbol RK (Eds). NOAA Tech Memo NMFS-NE-XXX. June 2020.

de Jong K, Forland N, Amorim MCP, Rieucau G, Slabbekoorn H, Sivle LD. 2020. Predicting the effects of anthropogenic noise on fish reproduction. Rev Fish Biol Fisheries 30, 245–268. https://doi.org/10.1007/s11160-020-09598-9.

Degraer S, Carey DA, Coolen JWP, Hutchison ZL, Kerckhof F, Rumes B, Vanaverbeke J. 2020. Offshore wind farm artificial reefs affect ecosystem structure and functioning. Oceanography 33(4): 48-57.

Dorrell RM, Lloyd CJ, Lincoln BJ, Rippeth TP, Taylor JR, Caulfield CP, Sharples J, Pollon JA, Scannel BD, Greaves DM, Hall RA, Simpson JH. 2022. Anthropogenic mixing in seasonally stratified shelf seas by offshore wind farm infrastructure. Front. Mar. Sci. 9, 1–25.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Service DPC (EDR). 2022. Offshore visual impact assessment. Appendix Q1 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. November 2022.

Exponent Engineering P.C. 2022. Onshore DC and AC magnetic field assessment. Appendix J2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Federal Maritime and Hydrographic Agency, Helmholtz-Zentrum Hereon (BSH and Hereon). 2022. Chemical emissions from offshore wind farms. Summary of the project OffCEm. [accessed 2023 May 25]. https://tethys.pnnl.gov/author/federal-maritime-hydrographic-agency.

Germano J, Parker J, Charles J. 1994. Monitoring cruise at the Massachusetts Bay disposal site, August 1990. DAMOS Contribution No. 92. U.S. Army Corps of Engineers, New England Division. Waltham, Massachusetts.

Goodale MW, Gilbert AT, Stenhouse IJ. 2022. Sunrise Wind avian and bat post-construction monitoring framework. Appendix P2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC and Stantec Consulting Services Inc. August 2022.

Guarinello ML, Carey DA. 2020. Multi-modal approach for benthic impact assessments in moraine habitats: a case study at the Block Island Wind Farm. Estuaries and Coasts. Special Issue: Shallow Water Mapping.

Harsanyi P, Scott K, Easton BA, de la Cruz Ortiz G, Chapman EN, Piper AR, Rochas CV, Lyndon AR. 2022. The effects of anthropogenic electromagnetic fields (EMF) on the early development of two commercially important crustaceans, European lobster, *Homarus gammarus* (L.) and edible crab, *Cancer pagurus* (L.). J. Mar. Sci. Eng. 10(5):564-581.

Hastings MC, Popper AN. 2005. Effects of sound on fish (Report No. 43A0139). Prepared for California Department of Transportation. 82 p.

Hawkins, A. 2022. The importance of sound to the Atlantic cod, *Gadus morhua*, and the Atlantic haddock, *Melanogrammus aeglefinus*. J. Acoust. Soc. Am. 1 September 2022; 152 (3): 1605–1614. https://doi.org/10.1121/10.0013994.

Hirsch ND, DiSalvo LH, Peddicord R. 1978. Effects of dredging and disposal on aquatic organisms. Vicksburg, Mississippi: U.S. Army Corps of Engineers. Technical Report DS-78-5.

Hutchison ZL, Bartley ML, Degraer S, English P, Khan A, Livermore J, Rumes B, King JW. 2020a. Offshore wind energy and benthic habitat changes: lessons from Block Island Wind Farm. Oceanography 33(4):58-69.

Hutchison ZL, Gill AB, Sigray P, He H, King JW. 2020b. Anthropogenic electromagnetic fields (EMF) influence the behaviour of bottom-dwelling marine species. Scientific Reports 10(1):4219.

Kenny AJ, Rees HL. 1994. The effects of marine gravel extraction on the macrobenthos: early post-dredging recolonization. Marine Pollution Bulletin 28(7):442-447.

Kraus C, Carter L. 2018. Seabed recovery following protective burial of subsea cables - observations from the continental margin. Ocean Engineering 157:251-261.

Kraus SD, Leiter S, Stone K, Wikgren B, Mayo C, Hughes P, Kenney RD, Clark CW, Rice AN, Estabrook B, Tielens J. 2016. Northeast large pelagic survey collaborative aerial and acoustic surveys for large whales and sea turtles. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No. OCS Study BOEM 2016-054.

Langan JA, McManus MC, Zemeckis DR, Collie JS. 2020. Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. Fishery Bulletin 118: 145-156.

Loring PH, McLaren JD, Smith PA, Niles LJ, Koch SL, Goyert HF, Bai H. 2018. Tracking movements of threatened migratory rufa red knots in U.S. Atlantic Outer Continental Shelf waters. Sterling, Virginia: U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. 147 p. Report No.: BOEM 2018-046.

Madsen PT, Wahlberg M, Tougaard J, Lucke K, Tyack P. 2006. Wind turbine underwater noise and marine mammals: Implications of current knowledge and data needs. Marine Ecology Progress Series 309:279-295.

McGrew KA, Crowell SE, Fiely JL, Berlin AM, Olsen GH, James J, Hopkins H, Williams CK. 2022. Underwater hearing in sea ducks with applications for reducing gillnet bycatch through acoustic deterrence. Journal of Experimental Biology 225(20). 10.1242/jeb.243953.

Middleton P, Barnhart B. 2022. Supporting National Environmental Policy Act documentation for offshore wind energy development related to high voltage direct current cooling systems. Washington (DC): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2022-023. 13 p.

National Marine Fisheries Service (NMFS). 2022. Multi-species pile driving calculator. Version 1.2. Excel file. Updated August 2022. [accessed 2022 Oct 15]. https://media.fisheries.noaa.gov/2022-09/BLANK%20Multi-Species%20%28AUGUST%202022b%29%20PUBLIC_508_OPR1.xlsx.

National Park Service (NPS). 2017. The secretary of the interior's standards for the treatment of historic properties with guidelines for preserving, rehabilitating, restoring & reconstructing historic buildings. [accessed 2023 Nov 21]. https://www.nps.gov/orgs/1739/upload/treatment-guidelines-2017-part1-preservation-rehabilitation.pdf

National Park Service (NPS). 2021a. Fire Island National Seashore, New York: basic information. Washington (DC): National Park System. [last updated 2021 Sep 03; accessed 2022 Jan 20]. https://www.nps.gov/fiis/planyourvisit/basicinfo.htm.

National Park Service (NPS). 2021b. Section 110 of the National Historic Preservation Act. Available at: https://www.nps.gov/fpi/ Section110.html. Accessed April 29, 2021.

National Renewable Energy Laboratory (NREL). 2021. Life cycle greenhouse gas emissions from electricity: update. [accessed 2023 Nov 11]. https://www.nrel.gov/docs/fy21osti/80580.pdf.

New York State Energy Research & Development Authority (NYSERDA). 2020. Digital aerial baseline survey of marine wildlife in support of offshore wind energy. Third annual report: Summer 2016–Spring 2019, Sixth interim report. Prepared for New York State Energy Research and Development Authority by Normandeau Associates Inc. with APEM Ltd.

Normandeau Associates. 2014. Understanding the habitat value and function of shoal/ridge/trough complexes to fish and fisheries on the Atlantic and Gulf of Mexico outer continental shelf. Bedford, New Hampshire: U.S. Department of the Interior, Bureau of Ocean Energy Management. 116 p.

Ordtek. 2022. Munitions and explosives of concern and unexploded ordinance with risk assessment and risk mitigation strategy confidential. Appendix G2 in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Ørsted Offshore North America. 2021. Fisheries communication and outreach plan. Appendix B in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. October 2021.

Payne PM, Heinemann DW. 1993. The distribution of pilot whales (*Globicephala* spp.) in shelf/shelf-edge and slope waters of the Northeastern United States, 1978-1988. Reports of the International Whaling Commission (Special Issue 14):51-68.

Pinsky ML, Selden RL, Kitchel ZJ. 2020. Climate-driven shifts in marine species ranges: scaling from organisms to communities. Annual Review of Marine Science 12: 153-179.

Popper AN, Hawkins AD, Fay RR, Mann DA, Bartol SM, Carlson T, Coombs S, Ellison WT, Gentry RL, Halvorsen M, Lokkeborg S, Rogers PH, Southall B, Zeddies DG, Tavolga WN. 2014. Sound exposure guidelines. ASA S3/SC1.4 TR-2014 sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. Springer Briefs in Oceanography. Springer, Cham.

Pugliares KR, French TW, Jones GS, Niemeyer ME, Wilcox LA, Freeman BJ. 2016. First records of the short-finned pilot whale (*Globicephala macrorhynchus*) in Massachusetts, U.S.A: 1980 and 2011. Aquatic Mammals 42(3):357-362.

Rhode Island Coastal Resources Management Council (RICRMC). 2010. Rhode Island ocean special area management plan (SAMP), volumes 1 and 2. Prepared for the Coastal Resources Management Council. Providence, Rhode Island. Coastal Resources Center, University of Rhode Island, Narragansett, Rhode Island.

Rone BK, Pace I, Richard M. 2012. A simple photograph-based approach for discriminating between free-ranging long-finned (*Globicephala melas*) and short-finned (*G. macrorhynchus*) pilot whales off the east coast of the United States. Marine Mammal Science 28(2):254-275.

Siddagangaiah S., Chen CF, Hu WCM, Pieretti N. 2022. Impact of pile-driving and offshore windfarm operational noise on fish chorusing. Remote Sensing in Ecology and Conservation, 8: 119-134. https://doi.org/10.1002/rse2.231.

Sigray P, Linné M, Andersson MH, Nöjd A, Persson LKG, Gill AB, Thomsen F. 2022. Particle motion observed during offshore wind turbine piling operation. Marine Pollution Bulletin 180.10.1016/j.marpolbul.2022.113734.

Solé M, De Vreese S, Fortuño JM, van der Schaar M, Sánchez AM, André M. 2022. Commercial cuttlefish exposed to noise from offshore windmill construction show short-range acoustic trauma. Environmental Pollution: 312. https://doi.org/10.1016/j.envpol.2022.119853.

Stanley JA, Caiger PE, Phelan B, Shelledy K, Mooney TA, Van Parijs SM. 2020. Ontogenetic variation in the auditory sensitivity of black sea bass (*Centropristis striata*) and the implications of anthropogenic sound on behavior and communication. Journal of Experimental Biology 223 (13): jeb219683. https://doi.org/10.1242/jeb.219683.

Stantec Consulting Services Inc. 2022. Offshore Ecological assessment and field survey report confidential. Appendix L in Construction and Operations Plan Sunrise Wind Farm. Prepared for Sunrise Wind LLC. August 2022.

Sunrise Wind LLC (Sunrise Wind). 2022a. Fisheries and benthic monitoring plan. Appendix AA1 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC (Sunrise Wind). 2022b. Sunrise Wind benthic monitoring plan – New York State waters. Appendix AA2 in Construction and Operations Plan Sunrise Wind Farm. April 2022.

Sunrise Wind LLC (Sunrise Wind). 2023a. Boulder relocation plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted in response to RFI received on January 11, 2023. February 2023.

Sunrise Wind LLC (Sunrise Wind). 2023b. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Thorne LH, Foley HJ, Baird RW, Webster DL, Swaim ZT, Read AJ. 2017. Movement and foraging behavior of short-finned pilot whales in the Mid-Atlantic Bight: importance of bathymetric features and implications for management. Marine Ecology Progress Series 584:245-257.

United States Environmental Protection Agency (USEPA). 2006. Regional benefits analysis for the final section 316(b) phase III existing facilities rule. [accessed 2023 Nov 21]. https://www.epa.gov/sites/default/files/2015-04/documents/cooling-water_phase-3_regional-benefits_2006.pdf.

Van Hoeck RV, Rowell TJ, Dean MJ, Rice AN, Van Parijs SM. 2023. Comparing Atlantic cod temporal spawning dynamics across a biographic boundary: insight from passive acoustic monitoring. Marine and Coastal Fisheries 15(2).

K.4.15. Appendix P

Sunrise Wind LLC (Sunrise Wind). 2023. Construction and operations plan. Sunrise Wind Farm Project. Prepared by Stantec Consulting Services Inc. Submitted to Bureau of Ocean Energy Management. September 2023. 945 p.

Sunrise Wind - Appendix L: Glossary

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APPENDIX L: GLOSSARY

Term	Definition
affected environment	Environment as it exists today that could be impacted by the proposed Project
algal blooms	Rapid growth of the population of algae, also known as algae bloom
allision	A moving ship running into a stationary ship / object
ancient submerged landform feature	A submerged landform as it was in ancient times
anthropogenic	Generated by human activity
archaeological resource	Historical place, site, building, shipwreck, or other archaeological site on the American landscape
automatic identification system	Automatic tracking system used on vessels to monitor ship movements and avoid collision
baleen whale	A cetacean with baleens (whalebones) instead of teeth
below grade	Below ground level
benthic	Related to the bottom of a body of water
benthic resources	The seafloor surface, the substrate itself, and the communities of bottom-dwelling organisms that live within these habitats
Cetacea	Order of aquatic mammals made up of whales, dolphins, porpoises, and related lifeforms
coastal habitat	Coastal areas where flora and fauna live, including salt marshes and aquatic habitats
coastal waters	Waters in nearshore areas where bottom depth is less than 98.4 feet
coastal zone	The lands and waters starting at 3 nautical miles from the land and ending at the first major land transportation route
commercial fisheries	Areas or entities raising and/or catching fish for commercial profit
commercial-scale wind energy facility	Wind energy facility usually greater than 1 megawatt that sells the produced electricity

Term	Definition
criteria pollutant	One of six common air pollutants for which the U.S. Environmental Protection Agency sets National Ambient Air Quality Standards: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, or sulfur dioxide
critical habitat	Geographic area containing features essential to the conservation of threatened or endangered species
cultural resource	Historical districts, objects, places, sites, buildings, shipwrecks, and archeological sites on the American landscape, as well as sites of traditional, religious, or cultural significance to cultural groups, including Native American tribes
culvert	Structure, usually a tunnel, allowing water to flow under an obstruction (e.g., road, trail)
cumulative impacts	Impacts that could result from the incremental impact of a specific action, such as the proposed Project, when combined with other past, present, or reasonably foreseeable future actions or other projects; can occur from individually minor, but collectively significant actions that take place over time
demersal	Living close to the ocean floor
design envelope	The range of proposed Project characteristics defined by the applicant and used by the Bureau of Ocean Energy Management (BOEM) for purposes of environmental review and permitting
dredging	Removal of sediments and debris from the bottom of lakes, rivers, harbors, and other water bodies
duct bank	Underground structure that houses the onshore export cables, which consists of polyvinyl chloride (PVC) pipes encased in concrete
ecosystem	Community of interacting living organisms and nonliving components (such as air, water, soil)
electromagnetic field	A field of force produced by electrically charged objects and containing both electric and magnetic components
embayment	Recessed part of a shoreline
endangered species	A species that is in danger of extinction in all or a significant portion of its range

Term	Definition
Endangered Species Act–listed species	Species listed under the Endangered Species Act
ensonification	The process of filling with sound
environmental consequences	The potential impacts that the construction, operations, maintenance, and decommissioning of the proposed Project would have on the environment
environmental justice communities	Minority and low-income populations affected by the proposed Project and alternatives
environmental protection measure (EPM)	Measure proposed in COP to avoid or minimize potential impacts
epifauna	Fauna that lives on the surface of a seabed (or riverbed), or is attached to underwater objects or aquatic plants or animals
essential fish habitat	"Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (50 Code of Federal Regulations 600)
export cables	Cables connecting the wind facility to the onshore electrical grid power
export cable corridor	Area identified for routing the entire length of the onshore and offshore export cables
federal aids to navigation	Visual references operated and maintained by USCG, including radar transponders, lights, sound signals, buoys, and lighthouses, that support safe maritime navigation
finfish	Vertebrate and cartilaginous fishery species, not including crustaceans, cephalopods, or other mollusks
for-hire commercial fishing	Commercial fishing on a for-hire vessel, i.e., a vessel on which the passengers make a contribution to a person having an interest in the vessel in exchange for carriage
for-hire recreational fishing	Fishing from a vessel carrying a passenger for hire who is engaged in recreational fishing
foundation	The bases to which the wind turbine generators and offshore converter station are installed on the seabed. Three types of foundations have been considered and reviewed for the Project: jacket, monopile, or gravity-based structure. Monopile is the selected foundation type for the Project.

Term	Definition
geomagnetic	Relating to the magnetism of the Earth
hard-bottom habitat	Benthic habitats comprised of hard-bottom (e.g., cobble, rock, and ledge) substrates
historic property	Prehistoric or historic district, site, building, structure, or object that is eligible for or already listed in the National Register of Historic Places. Also includes any artifacts, records, and remains (surface or subsurface) related to and located within such a resource
historical resource	Prehistoric or historic district, site, building, structure, or object that is eligible for or already listed in the NRHP; also includes any artifacts, records, and remains (surface or subsurface) related to and located within such a resource
horizontal directional drilling	Trenchless technique for installing underground cables, pipes, and conduits using a surface-launched drilling rig
hull	Watertight frame or body of a ship
infauna	Fauna living in the sediments of the ocean floor (or river or lake beds)
inter-array cables	Cables connecting the wind turbine generators to the electrical service platforms
interconnection facility	Substation connecting the proposed Project to the existing bulk power grid system
inter-link cables	Cables connecting the electrical service platforms to one another
invertebrate	Animal with no backbone
jacket foundation	Latticed steel frame with three or four supporting piles driven into the seabed
jack-up vessel	Mobile and self-elevating platform with buoyant hull
jet excavation	Process of moving or removing soil with a jet

Term	Definition
jet plowing	Plowing in which the jet plow, with an adjustable blade, or plow rests on the seafloor and is towed by a surface vessel; the jet plow creates a narrow trench at the designated depth, while water jets fluidize the sediment within the trench; in the case of the proposed Project, the cables would then be feed through the plow and laid into the trench as it moves forward; the fluidized sediments then settle back down into the trench and bury the cable
knot	Unit of speed equaling 1 nm per hour
landfall site	The shoreline landing site at which the offshore cable transitions to onshore
lease area	The entire area that Sunrise Wind, LLC purchased from BOEM
marine mammal	Aquatic vertebrate distinguished by the presence of mammary glands, hair, three middle ear bones, and a neocortex (a region of the brain)
marine waters	Waters in offshore areas where bottom depth is more than 98.4 feet (30 meters)
mechanical cutter	Method of submarine cable installation equipment that involves a cutting wheel or excavation chain to cut a narrow trench into the seabed allowing the cable to sink under its own weight or be pushed to the bottom of the trench via a cable depressor
mechanical plow	Method of submarine cable installation equipment that involves pulling a plow along the cable route to lay and bury the cable. The plow's share cuts into the soil, opening a temporary trench which is held open by the side walls of the share, while the cable is lowered to the base of the trench via a depressor. Some plows may use additional jets to fluidize the soil in front of the share.
monopile or monopile foundation	A long steel tube driven into the seabed that supports a tower
nautical mile	A unit used to measure sea distances and equivalent to approximately 1.15 miles

Term	Definition
offshore converter station	Converts the power generated by the wind turbine generators and transforms it to a higher voltage for transmission; transports that power to the Project's onshore electrical infrastructure via the Sunrise Wind Export Cable
offshore Sunrise Wind Export Cable	Export cables located in state or marine waters that transport power from the Sunrise Wind Farm to the transition joint bay
onshore interconnection cable	Transports power from the new onshore converter station location to the existing grid at the Holbrook Substation
onshore substation	Substation connecting the proposed Project to the existing bulk power grid system
onshore Sunrise Wind Export Cable	Export cables located on land
onshore transmission cable	Transports power from the transition joint bay to the new onshore converter station
operations and maintenance facilities	Would include offices, control rooms, warehouses, shop space, and pier space
outer continental shelf	All submerged land, subsoil, and seabed belonging to the United States but outside of states' jurisdiction
pile	A type of foundation akin to a pole
pile driving	Installing foundation piles by driving them into the seafloor
pinnipeds	Carnivorous, semiaquatic, fin-footed marine mammals, also known as seals
pin pile	Small-diameter pipe driven into the ground as foundation support
plume	Column of fluid moving through another fluid
private aids to navigation	Visual references operated and maintained by the U.S. Coast Guard, including radar transponders, lights, sound signals, buoys, and lighthouses, that support safe maritime navigation
Project	The siting and development of the Sunrise Wind Farm and the Sunrise Wind Export Cable
Project Area	The combined onshore and offshore area where proposed Project components would be located

Term	Definition
protected species	Endangered or threatened species that receive federal protection under the Endangered Species Act of 1973 (as amended)
right-of-way	Registered easement on private land that allows access by another entity
scour protection	Protection consisting of rock and stone that would be placed around all foundations to stabilize the seabed near the foundations as well as the foundations themselves
scrublands	Plant community dominated by shrubs and often also including grasses and herbs
sessile	Attached directly by the base
silt substrate	Substrate made of a granular material originating from quartz and feldspar, and whose size is between sand and clay
soft-bottom habitat	Benthic habitats include soft-bottom (i.e., unconsolidated sediments) and hard-bottom (e.g., cobble, rock, and ledge) substrates, as well as biogenic habitat (e.g., eelgrass, mussel beds, and worm tubes) created by structure-forming species
substrate	Earthy material at the bottom of a marine habitat; the natural environment that an organism lives in
Sunrise Wind Farm	Located within federal waters (Atlantic Ocean) on the outer continental shelf, specifically in the lease area
Sunrise Wind LLC	Sunrise Wind, the Applicant
Sunrise Wind Offshore Wind Project	The work area containing all proposed wind turbine generators, offshore substations, and inter-array cables
suspended sediments	Very fine soil particles that remain in suspension in water for a considerable period of time without contact with the bottom. Such material remains in suspension due to the upward components of turbulence and currents, and/or by suspension.
threatened species	A species that is likely to become endangered within the foreseeable future
tidal energy project	Project related to the conversion of the energy of tides into usable energy, usually electricity

Term	Definition
tidal flushing	Replacement of water in an estuary or bay because of tidal flow
transition vault	Underground concrete transition vault that to be constructed at the landing site and inside of which offshore and shore Sunrise Wind Export Cable would be spliced together.
trawl	A large fishing net dragged by a vessel at the bottom or in the middle of sea or lake water
turbidity	A measure of water clarity
utility right-of-way	Registered easement on private land that allows utility companies to access the utilities or services located there
vibracore	Technology/technique for collecting core samples of underwater sediments and wetland soils
viewshed	Area visible from a specific location
visual resource	The visible physical features on a landscape, including natural elements such as topography, landforms, water, vegetation, and manmade structures
wetland	Land saturated with water; marshes; swamps
wind energy	Electricity from naturally occurring wind
wind energy area	Areas with significant wind energy potential and defined by BOEM
wind turbine generator	Component that puts out electricity in a structure that converts kinetic energy from wind into electricity

Sunrise Wind - Appendix M: List of Preparers and Reviewers

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LIST OF TABLES

APPENDIX M: LIST OF PREPARERS AND REVIEWERS

Table M-1. Bureau of Ocean Energy Management Contributors

Name	Role/Resource Areas
National Environmental Policy Act (NEPA) Coordinator	
Brune, Genevieve	Environmental Protection Specialist
Resource Scientists and Contributors	
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Baker, Kyle	Marine Mammals; Sea Turtles; NMFS BA
Bigger, David	Birds; Bats; Coastal Habitat and Fauna; USFWS BA
Eng, Lissa	Public Involvement
Chaky, Sindey	Land Use and Coastal Infrastructure; Recreation and Tourism
Chaiken, Emma	Demographics, Employment, Economics
Conrad, Alexander	Marine Acoustics
Chaky, Sindey	Environmental Justice
Creed, Stephen	Geographic Information Systems (GIS)
De Zeeuw, Maureen	Birds
Denes, Sam	Marine Acoustics
Draher, Jennifer	Geologic Hazards; Water Quality
Grefsrud, Pamela	Wetlands
Heinze, Martin	Demographics, Employment, Economics
Horrell, Christopher	Marine Cultural Resources; Cultural Resources; FOE; Section 106 Consultation
Howson, Ursula	Benthic Resources; Coastal Habitats; Commercial Fisheries and For-Hire Recreational Fishing; Finfish, Invertebrates, Essential Fish Habitat (EFH); NOAA NMFS EFH consultation
Jensen, Mark	Demographics, Employment, Economics
Kates Varghese, Hilary	Marine Acoustics
Klein, Kimberly	Marine Mammals
Landers, Lisa	NEPA Section Chief

Name	Role/Resource Areas
Labak, Stanley	Marine Acoustics
McCarty, John	Visual Resources
McCoy, Angel	Meteorologist, Technical Design Elements
McGuffin, Andrew	Geologic Hazards
Miller, Jennifer	Geologic Hazards
Moshier, Marissa	Cultural Resources; FOE; Section 106 Consultation
O'Connell, Daniel	Technical Design Elements
Rutland, Jordan	Marine Mammals; Sea Turtles; NMFS BA
Schnitzer, LK	Cultural Resources; FOE; Section 106 Consultation
Slayton, Ian	Air Quality, Planned Activities Scenario
Staaterman, Erica	Marine Acoustics
Stokely, Sarah	Cultural Resources; FOE Section 106 Consultation
Chaky, Sindey	Environmental Justice
Wolf, Jacob	Air Quality

Table M-2. Reviewers

Name	Title	Agency
BOEM and DOI Reviewers		
Baker, Karen	Chief, Environment Branch for Renewable Energy	BOEM
Diamond, David	Deputy Chief, Environment Branch for Renewable Energy	BOEM
Brown, William	Chief Environmental Officer	BOEM
Brune, Genevieve	Environmental Protection Specialist	BOEM
Hildreth, Emily	Renewable Energy Policy Specialist	BOEM
Landers, Lisa	NEPA Section Chief	BOEM
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Name	Title	Agency
Sarver, Kathryn	Attorney-Advisor, Office of the Solicitor	DOI
Cooperating and Participating Agency Reviewers		
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Michele Desautels	District 1	U.S. Coast Guard
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Engler, Lisa	Director	Massachusetts Office of Coastal Zone Management
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Gray, Terry	Acting Director	Rhode Island Coastal Resource Management Council
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McLean, Laura	Coastal Energy Review Specialist	New York Department of State
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Willis, Jeffrey	Executive Director	Rhode Island Coastal Resource Management Council

Table M-3. Consultants

Name	Company	Role/Resource Area
Project Management / Coordinators		
Oakes, Timothy	Kleinschmidt Associates	Project Director
Fitzgibbons, Kim	Kleinschmidt Associates	Project Manager; Quality Assurance and Quality Control
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Name	Company	Role/Resource Area
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Gorin, Hannah	Kleinschmidt Associates	GIS
Yoder, Andrew	Kleinschmidt Associates	GIS
Sherman, Maegan	Kleinschmidt Associates	Reference Manager
Gardner, Lynette	Kleinschmidt Associates	DEIS Comment Management; Quality Assurance and Quality Control
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Kahn, Kelsey	FHI Studio	Public Engagement
Miller, Marcy	FHI Studio	Public Engagement
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Banda, Anna	Azura	Bats; Benthic Resources; Bird; Marine Mammals; Sea Turtles
Binder, Jeff	Azura	Biological Resources Library
Blackwell, Liz	SEARCH, Inc.	Architectural Cultural Resources
Butwin, Matthew	Prospect Hill Consulting, LLC	Demographics, Employment, Economics; Environmental Justice; Commercial Fisheries and For-hire Recreational Fishing
Drahovzal, Sarah	Kleinschmidt Associates	Wetlands
Enright, Jeff	SEARCH, Inc.	Marine Cultural Resources
Fisher, Cameron	48 North Solutions, Inc.	Marine Mammals
Gut, Jennifer	Kleinschmidt Associates	Other Uses
Hockersmith, Kelly	SEARCH, Inc.	Terrestrial Cultural Resources
Hughes, Zach	Salus Resources, Inc.	Bats; Birds; Marine Mammals; Sea Turtles
Kaskey, Joseph	Azura	Bats; Birds

Name	Company	Role/Resource Area
Klosowski, Karen	Kleinschmidt Associates	Scenic and Visual Resources; Recreation and Tourism; Land Use and Coastal Infrastructure
Latham, Pam	Research Planning, Inc.	Coastal Habitat and Fauna; EFH Assessment
Loucks, Jordon	SEARCH, Inc.	Section 106 Lead
Nebiolo, Kevin	Kleinschmidt Associates	Navigation and Vessel Traffic; Other Uses
Rasmussen, Ross	Azura	Bats; Birds
Roulson, Leanne	Salus Resources, Inc.	Benthic Resources
Russo, Rachel	Kleinschmidt Associates	Air Quality; Water Quality
Tomichek, Christine	Kleinschmidt Associates	Finfish, Invertebrates, and Essential Fish Habitat; EFH Assessment
Whitt, Amy	Azura	Bats; Birds; Marine Mammals; Sea Turtles

Sunrise Wind - Appendix N: List of Agencies, Organizations, And Persons to Whom Copies of the Environmental Impact Statement Are Sent

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LIST OF TABLES

APPENDIX N: LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE ENVIRONMENTAL IMPACT STATEMENT ARE SENT

This EIS is available in electronic form for public viewing at https://www.boem.gov/renewable-energy/state-activities/sunrise-wind. Hard copies and digital versatile disks (DVDs) of the EIS can be requested by contacting the Program Manager, Office of Renewable Energy in Sterling, Virginia. Publication of the Draft EIS initiated a 60-day comment period where government agencies, members of the public, and interested stakeholders could provide comments and input. BOEM accepted comments received or postmarked no later than February 14, 2023, in any of the following ways:

- In hard copy form, delivered by hand or by mail, enclosed in an envelope labeled "Sunrise Wind COP EIS" and addressed to Program Manager, Office of Renewable Energy, Bureau of Ocean Energy Management, 45600 Woodland Road, Sterling, Virginia 20166.
- Through the regulations.gov web portal by navigating to http://www.regulations.gov and searching for docket number "BOEM-2022-0071."
- By attending one of the EIS public meetings at the locations and dates listed in the notice of availability and providing written or verbal comments. BOEM used comments received during the public comment period to inform its preparation of the final EIS, as appropriate. EIS notification lists for the Project are provided in Table N-1 through Table N-6.

Table N-1. Federal Agencies - Cooperating

Cooperating Federal Agencies	Contact	Location
Army Corps of Engineers	Christopher Minck 917.790.8547 Christopher.W.Mincki@usace.army.mil	New York District
Bureau of Safety and Environmental Enforcement	Juliette Giordano 571.491.7470 Juliette.giordano@bsee.gov	Sterling, Virginia
Environmental Protection Agency	Timothy Timmermann 617.918.1025 Timmermann.timothy@epa.gov	Boston, Massachusetts
National Marine Fisheries Service	Sue Tuxbury 978.281.9176 Susan.tuxbury@noaa.gov	Gloucester, Massachusetts
United States Coast Guard	George Detweiler 202.372.1566 George.h.detweiler@uscg.mil	Washington, D.C.
Fish and Wildlife Service	Ian Drew Ian_drew@fws.gov	Long Island, New York

National Park Service	Mary Krueger 617.223.5066 Mary_C_Krueger@nps.gov	Fitchburg, Massachusetts

Table N-2. Federal Agencies - Participating

Participating Federal Agencies	Contact	Location
Advisory Council on Historic Preservation	Christopher Koeppel 202.517.0222 ckoeppel@achp.gov	Washington, D.C.
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Department of Navy	Matthew Senska 703.614.2201 Matthew.senska@navy.mil	Washington, D.C.
Department of Defense	Terry Bowers 703.693.9447 Terry.l.bowers14.civ@mail.mil	New Alexandria, Virginia

Table N-3. State and Local Agencies or Other Interested Parties

Cooperating State Agencies	Contact	Location
Massachusetts Office of Coastal Zone Management	Lisa Engler 617.626.1230 Lisa.engler@mass.gov	Boston, Massachusetts
Rhode Island Coastal Resources Management Council	Jeffrey Willis 401.783.3370 jwillis@crmc.ri.gov	Wakefield, Rhode Island
Rhode Island Department of Environmental Management	Terry Gray 401.222.2771 Terry.gray@dem.ri.gov	Providence, Rhode Island
New York State Department of State	Laura McLean 315.235.0351 Laura.McLean@dos.ny.gov	Albany, New York

Table N-4. Tribes and Native Organizations

Tribes and Native Organizations	State
Mashpee Wampanoag Tribe	Massachusetts
Wampanoag Tribe of Gay Head (Aquinnah)	Massachusetts
Mashantucket Pequot Tribal Nation	Connecticut
Shinnecock Indian Tribe	New York

Table N-5. Section 106 Consulting Parties

Government or Organization	Section 106 Consulting Party	Contact
SHPO	New York State Division for Historic Preservation	Tim Lloyd, Archaeologist
Federally Recognized Tribes	Mashpee Wampanoag Tribe	Brian Weeden, Chairman David Weeden, THPO
	Mashantucket Pequot Tribal Nation	Michael KickingBear Johnson, Deputy THPO
	Wampanoag Tribe of Gay Head-Aquinnah	Cheryl Andrews-Maltais, Chairwoman Bettina Washington, THPO
State Government	Rhode Island Department of Environmental Management	Ron Gagnon, Chief of Technical and Customer Assistance
State Tribe	Unkechaug Nation	Harry Wallace, Chief Kenneth Harris, Chief
NGO (Former State Tribe)	Montaukett Indian Nation	Sandi Brewster-Walker, Executive Director, and Governor
Historical Massachusetts Tribe	Chappaquiddick Tribe of Wampanoag Nation	Penny Gamble Williams, Director

Government or Organization	Section 106 Consulting Party	Contact
Nongovernmental Organizations or Groups	Gay Head Lighthouse Advisory Committee	Len Butler, Chairman
	Southeast Lighthouse Foundation	Lisa Nolan, Executive Director William J. Cook, Special Counsel, Cultural Heritage Partners, PLLC
	Salve Regina University	Michael Semenza, VP University Relations
	Block Island Historical Society	Pamela Littlefield Gasner, Executive Director Bob Champagne-Willis, Board President
	Norman Bird Sanctuary	Kaity Ryan, Executive Director
	Alliance to Protect Nantucket Sound The Preservation Society of Newport County (operate The Breakers, Marble House, etc.)	Sandy Taylor, Executive Asst.
	The Preservation Society of Newport County (operate The Breakers, Marble House, etc.)	Trudy Coxe, CEO & Executive Director
	Newport Restoration Foundation	Aylssa Lozupone, Director of Preservation
	Nantucket Preservation Trust	Mary Bergman, Executive Director
	Long Island Historical Societies	Georgette Grier-Key, President
	Preservation Long Island	Alexandra Parsons Wolfe, Executive Director
	Preserve Rhode Island	Paul Trudeau, Director of Preservation
	Preserve Rhode Island	Valerie Talmage, Executive Director
Local Government	City of Newport	Joseph J. Nicholson, Jr., City Manager

Government or Organization	Section 106 Consulting Party	Contact
	County of Dukes	Tristan Israel, Commissioner
	Town of Aquinnah	Jeffery Madison, Town Administrator
	Town of Bourne	Kathleen Thut, Town Administrator
	Town of Charlestown	Mark S. Stankiewicz, Town Administrator
	Town of East Hampton	Peter Van Scoyoc, Supervisor Joanne Pilgrim, Executive Assistant Brian Frank, Chief Environmental Analyst
	Town of Middletown	Shawn Brown, Town Administrator
	Town of Nantucket	Lauren Sinatra, Town Manager C. Elizabeth Gibson, Town Manager
	Nantucket Planning & Economic Development Commission (NP&EDC)	Holly Backus, Preservation Planner
	Town of New Shoreham	Maryanne Crawford, Town Manager
	Town of North Stonington	Christine Dias, Administration and Finance Officer
	Town of Oak Bluffs	Wendy Brough, Acting Town Administrator
	Town of Brookhaven	Alan Duckworth, Environmental Analyst
Certified Local Government	Newport Historic District Commission	Helen Johnson, Preservation Planner
	Barnstable Historical Commission	Grayce Rogers, Administrative Assistant

Table N-6. Section 106 Consulting Parties - Landowners

Name	State
Roselle McConnell	Rhode Island
Michael Vitton	Rhode Island
Susan Petrovas	Rhode Island
William Willis	Rhode Island
Margaret Maloney	Rhode Island
Mark Stenning	Rhode Island
David Bush-Brown	Rhode Island
Donna Banky	Rhode Island
Blake Banky	Rhode Island
Al O'Neill	Rhode Island
Alexandra McCabe	Rhode Island
Helen Johnson	Rhode Island
Kathleen Keating Kits van Heyningen	Rhode Island
Martin Kits van Heyningen	Rhode Island
Austin Feeny	Rhode Island
Ronal Pulito	New York

Sunrise Wind - Appendix O: Responses to Comments on the Draft Environmental Impact Statement

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APPENDIX O: RESPONSES TO COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

O.1. Introduction

On December 12, 2022, the Bureau of Ocean Energy Management (BOEM) published a notice of availability for the Sunrise Wind Project Draft Environmental Impact Statement (EIS), consistent with the regulations implementing the National Environmental Policy Act (NEPA; 42 *USC* 4321 et seq.) to assess the potential impacts of the Proposed Action and alternatives. The Draft EIS was made available in electronic form for public viewing at https://www.boem.gov/renewable-energy/state-activities/sunrise-wind, and hard copies and/or electronic copies were delivered to other entities as specified in Appendix N of the Draft EIS. The NEPA review process requires agencies to allow the public the opportunity to comment on a Draft EIS. The notice of availability initiated a 60-day public comment period for the Draft EIS. The comment period closed on February 14, 2023. This appendix describes the Draft EIS public comment processing methodology and definitions. It also includes responses to comments received on the Draft EIS and describes where specific updates to the Final EIS can be found in the document.

O.2. Objective

BOEM reviewed and considered all written and oral public submissions received during the Draft EIS public review and comment period. BOEM's goal was to identify comments to be addressed in this Final EIS and to categorize those comments based on the applicable resource areas or NEPA topics. This categorization scheme allowed subject matter experts to review comments directly related to their areas of expertise and allowed BOEM to generate statistics based on the resource areas or NEPA topics addressed in each comment. All public comment submissions received can be viewed online at http://www.regulations.gov by typing "BOEM-2022-0071" in the search field.

O.3. Methodology

O.3.1. Terminology

The following terminology is used throughout this appendix:

- Submission: The entire content submitted by a single person or group at a single time. For example, a 10-page letter from a citizen, an email with a portable document format (PDF) attachment, and a transcript of an oral comment given at a public hearing were each considered to be a submission.

- Comment: A specific statement within a submission that expresses a sender's specific point of view, concern, question, or suggestion. A comment can consist of more than one sentence, as long as those grouped sentences express a single idea. One submission may contain many comments.

- Substantive Comment: Draft EIS submissions were reviewed to identify and categorize "substantive" comments. To be substantive, a comment must relate to the reasonably foreseeable impacts of the Proposed Action, alternatives, or cumulative actions and do one or more of the following:

    - Question (with supporting rationale) the accuracy of information in the Draft EIS;

    - Question (with supporting rationale) the adequacy of, methodology for, or assumptions used for the environmental analysis;

    - Present new information relevant to the analysis;

    - Present reasonable alternatives or mitigation measures other than those analyzed in the Draft EIS;

    - Present or cause modifications to alternatives or mitigation measures analyzed in the Draft EIS; or

    - Correct factual errors in the content of the Draft EIS.

- General Comment: General comments are comments other than substantive comments. General comments may:

    - Express interest or concern regarding an impact topic without providing specific comments on the information, methods, or findings presented in the Draft EIS;

    - Express general support for or opposition to the proposed Project; or

    - Comment on a topic unrelated to the proposed Project.

O.3.2. Comment Submittals

Federal agencies, state/local/tribal governments, and the general public had the opportunity to provide comments on the Draft EIS via the following mechanisms:

- Electronic submissions via www.regulations.gov on docket number BOEM-2022-0071;

- Hard-copy comment letters submitted to BOEM via traditional mail; and

- Comments submitted verbally at each of the public hearings.

BOEM held three online public hearings via Zoom to solicit verbal comments to inform the preparation of the Final EIS. The hearings were free and open to the public, with no registration required. The locations and dates of these hearings are outlined in Table O-1.

Table O-1. Public Hearings

Date	Time	Location
January 18, 2023	5:00 p.m. ET	Zoom Webinar
January 19, 2023	5:00 p.m. ET	Zoom Webinar
January 23, 2023	1:00 p.m. ET	Zoom Webinar

All submissions initially provided by methods other than www.regulations.gov, including the transcripts of comments recorded at each public hearing listed in Table O-1, were uploaded to the docket. Each submission, including testimony by individual speakers at the public hearings listed in Table O-1, was assigned a unique identification number. That unique Submission ID was retained throughout the comment management process for both submissions and the individual comments within those submissions.

O.3.3. Comment Processing

BOEM downloaded and reviewed all submissions from regulations.gov. These submissions were provided in Hypertext Markup Language (HTML) format, while attachments provided by stakeholders as part of their regulations.gov submission were typically provided in PDF or Microsoft Word format. Text from the HTML, as well as PDF, Word, and other text formats, were parsed, coded, and exported into a single Microsoft Excel file that served as the primary submission database. In cases where an attachment did not contain comments specific to the docket for the Sunrise Wind Draft EIS, the attachment was retained separately for BOEM reference as applicable and linked to the main body of the submission through the unique Submission ID. Examples of this type of attachment include copies of comment letters that were originally submitted during the scoping period, copies of comment letters that were originally submitted on another docket, or attached photos, published reports, news articles, or other secondary material. The submission database also included information about each submission, including the submitter's contact information, submission date, and whether the submitter was a government entity or agency.

Each submission and all oral testimony were read to identify individual substantive and general comments (as defined under Section O.3.1., *Terminology*). Each comment was parsed, coded, and exported to a spreadsheet that served as the master comment database. Then, each comment received a unique comment ID number tied to the Submission ID. For example, the fourth comment in regulations.gov submission 0001 was identified as BOEM-2022-0071-0001-0004.

Substantive comments from cooperating agencies and the Lessee were organized by agency or organization and presented verbatim in Sections O.4 and O.5. Other agency, stakeholder, and public comments were each assigned to one section of the Draft EIS, based on the document's table of contents, or to a general topic such as "NEPA/Public Involvement Process." Substantive and non-substantive comments from other agencies or stakeholders are presented verbatim in Section O.6. General comments are presented in Section O.7 and are categorized by opposition or support of the Project. General comments that were identical (or near identical) were grouped for a singular response, but submission IDs for each comment were retained.

Comments with foul language were not included in the comment database. No edits or grammatical corrections were made to the comments. All submissions are available for review at www.regulations.gov under docket number BOEM-2022-0071. BOEM received a total of 284 individual comment submissions; commenter names, affiliations, and submission IDs are presented in Section O.8.

O.4. Responses to Cooperating Agency Comments on the Draft EIS

O.4.1. Cooperating Federal Agencies

O.4.1.1. National Oceanic and Atmospheric Administration, National Marine Fisheries Service

Table O-2. Responses to Comments from National Oceanic and Atmospheric Administration, National Marine Fisheries Service [BOEM-2022-0071-0256]

NMFS Comment	Response
Environmentally Preferred Alternative We consider the Habitat Impact Minimization Alternative (Alternative C-2) to be the environmentally preferred alternative for the Sunrise Wind Project, as it would reduce impacts to Atlantic cod spawning habitat and other complex habitats found within the lease area, while still meeting the purpose and need of the project. In development of this alternative, NMFS identified priority areas based first on overlap with cod spawning activity, and then lease area overlap with complex habitats that are essential for cod and other demersal species. Large-scale offshore wind development on and adjacent to cod spawning activity and sensitive habitats on and around Cox Ledge remains a significant concern for our agency. Atlantic cod populations are in decline and significantly below target levels and the complex habitats used by this and other species are more vulnerable to long-term and permanent impacts from offshore wind development. Reducing impacts to these habitats will help minimize the risk of impacts on reproductive success of vulnerable cod populations, a species of biological, ecological, economic, and cultural significance to this region.	Thank you for your comment and support of Alternative C-2. This alternative is no longer technically feasible due to the discovery of glauconite sands in the Lease Area. United States Department of the Interior, Bureau of Ocean Energy Management (BOEM) has consulted with the National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS) to develop Alternative C-3, which considers avoidance of Atlantic cod spawning areas and complex habitats.

NMFS Comment	Response
Minimizing overlap with complex habitats will also reduce the extent of long-term to permanent impacts on hard bottom complex habitats associated with Cox Ledge. In June 2022, the New England Fishery Management Council approved a new habitat area of particular concern (HAPC) that overlaps with the Sunrise Wind project area. This action highlights the importance of this complex habitat and cod spawning habitats and creates an obligation to evaluate whether offshore wind development would adversely impact such habitats and, if so, to consider measures which would minimize that negative effect. We recommend BOEM take measures to ensure offshore wind development avoids and minimizes impacts to these vulnerable habitats, including the HAPC.	
In addition to the selection of Alternative C-2, we have identified other ways that impacts to NOAA trust resources could be further reduced in the lease area. We recommend BOEM extend the Habitat Impact Minimization Alternative to consider the full range of the project's Offshore Wind Renewable Energy Certificate Purchase and Sale Agreement (OREC). The DEIS does not consider additional turbine removal that would minimize habitat impact and still meet the OREC range of 880-924 MW, but rather focuses only on the maximum energy transmission in the COP of 1,034 MW. We recommend BOEM consider in the FEIS, as part of the Habitat Impact Minimization alternative, additional turbine removal and/or relocation that would meet the 880-924 MW range under the existing OREC, in addition to consideration of the 1,034 MW currently evaluated in the DEIS. The DEIS does not provide justification for excluding the consideration of an alternative that would meet the energy agreement under the	This alternative has been added under Alternative C-3 in the Final Environmental Impact Statement (EIS).

NMFS Comment	Response
OREC without pursuing excess capacity that would likely be associated with additional environmental impacts. We consider this a reasonable alternative that meets the purpose and need of the project and recommend it be evaluated as a means of further minimizing environmental impacts of the project.	
While the DEIS describes some distinction between the Habitat Impact Minimization Alternatives and the proposed action, the analysis does not fully describe the varying characteristics and habitats within the lease area. As a result, the impact analysis leads to the conclusion that there is limited distinction between the sub-alternatives (C-1 and C-2). The DEIS does not provide a full description of the lease area in the context of Southern New England and Cox Ledge, nor does it clearly describe the variations in habitats and resources within the lease area. Inclusion of both of these elements would allow BOEM to meaningfully and accurately distinguish impacts among the alternatives and sub-alternatives under consideration. The document should clarify where the lease area overlaps with cod spawning activity and complex habitat along the southern end of Cox Ledge. It should also discuss how habitat types differ within the lease area, including both within the priority areas, which are dominated by more complex and heterogeneous habitats, and the eastern portion of the lease, which is dominated by softer sediment and where relocation of 12 turbines is proposed. Currently, the DEIS appears to suggest all habitat types recover equally within a limited timeframe; however, this conclusion is not supported by the best available information, which indicates habitats of increasing complexity take measurably longer to recover. We	Thank you for your comment. Additional information has been added to the benthic and finfish sections that address your habitat concerns.

NMFS Comment	Response
recommend a thorough characterization of the lease area, including a more refined description of the diverse benthic habitat, be incorporated into the alternatives analysis in the FEIS. Additionally, we recommend that available figures (i.e., backscatter, boulder locations) be included to provide a clear distinction between the variation in habitat types and resources present in the lease area. This distinction should then be considered in the analysis of project impacts and comparison of alternatives.	
The analysis of Alternative C-2 outlines four WTG position configurations. While the Benthic Resources section of the DEIS refers to these configurations as Alternatives C-2a through C-2d, the DEIS does not analyze the layouts in any detail or identify them consistently as alternatives throughout all sections of the document. Based on how they are presented, we are interpreting these configurations as potential options for identifying turbines for relocation, rather than formal alternatives. While it is useful to consider various layout options, we do not recommend BOEM consider removing or relocating turbines based solely on boulder density, as suggested in the DEIS. Rather, we recommend BOEM consider the available cod spawning data to reduce overlap between turbine positions and spawning activity. We then recommend BOEM consider available habitat data to reduce overlap with complex habitats (e.g., cobbles, boulders) while also maintaining a continuous area that would be free from development to reduce overall impacts to these important habitat areas. Simply using boulder density as the metric for removal/relocation may not be fully protective of spawning activity or maintain continuous undisturbed areas of	Due to glauconite feasibility issues, Alternatives C-1 and C-2 are no longer feasible, and edits will not be made to the analysis or configuration of these alternatives. However, Alternative C-3 was developed, with NMFS input, based on habitat and Atlantic cod data. There are three sub-alternatives (Alternative C-3a, C-3b, and C-3c) put forward within the Final EIS that include the development of 80 wind turbine generators (WTGs), up to 84 WTGs, or up to 87 WTGs. Chapter 3 presents maps of benthic data, boulder density, and Atlantic cod data, all of which were considered in the development of Alternative C-3. When there are differences in impacts between these alternatives for a resource, they are analyzed separately within the resource section in Chapter 3. An example of no difference in impacts for these alternatives would be land use, since under these alternatives, no changes to land use would occur.

NMFS Comment	Response
complex habitats. We would be happy to work with you to help identify ways to further reduce impacts and we will also provide additional recommendations through our EFH consultation on this project.	
While additional text related to cod spawning activity was added to the DEIS, the full suite of potential impacts has not been analyzed and the DEIS does not consider the available data and information from studies conducted in the project area. These data should be used to identify areas of overlap between project activities and cod spawning and to develop appropriate mitigation measures. Additionally, the findings of the Atlantic Cod Stock Structure Working Group were recently published, and this information should be incorporated into the analysis in the FEIS. The DEIS suggests that a January through April pile driving time of year restriction designed to reduce impacts to North Atlantic right whales is protective of cod spawning. However, this statement does not reflect the most recent and best available scientific information which indicates that spawning in Southern New England waters is concentrated in November and December.	Available data has been added, including recent studies in the Project Area. Dean et al. (2020) described the Atlantic cod spawning period as occurring from November through March, with peak spawning from December through February. Langan et al. (2020) described Atlantic cod spawning as occurring from late December through mid-February based on the back-calculated growth rates of larvae collected in Narragansett Bay.
The DEIS's evaluation of impacts to cod spawning aggregations from construction activities outside of pile driving is also limited. There are multiple activities considered part of the seabed preparation process to clear the cobble/boulder habitats that would occur within known cod spawning aggregations; however, there is no analysis of impacts from seabed preparation on Atlantic cod spawning activity.	Text discussing the impact of seabed preparation on Atlantic cod has been added in Section 3.10.5.1.2.
Additionally, the DEIS does not discuss the proximity of the offshore converter station, and associated open loop cooling system, to cod spawning activity or potential impacts to eggs	The text was updated in Section 3.10.5.2.2, *Offshore Activities and Facilities*, *Entrainment*, to include all the mitigation measures proposed to minimize potential impacts to Atlantic cod.

NMFS Comment	Response
and larvae from project operation. The DEIS should identify, describe, and evaluate a full range of mitigation measures to protect (i.e., avoid or minimize disturbance of) cod spawning activity in this area. The Atlantic Cod Stock Structure Working Group identified five biological stocks in U.S. Waters, which includes a Southern New England stock. It will be important for BOEM to fully analyze impacts of this project on Southern New England cod and evaluate measures that could be undertaken to avoid and minimize those impacts.	
Outside the Habitat Impact Minimization Alternative, the DEIS does not identify any mitigation measures to protect this vulnerable life history stage. We recommend the FEIS evaluate additional mitigation measures, including time of year restrictions for construction activities, to avoid impacting Atlantic cod spawning activity. Given the vulnerability of this population, we are concerned the project, as proposed, will result in adverse population level effects (major adverse impacts) on cod populations in Southern New England if appropriate avoidance and minimization measures are not incorporated.	At this time, BOEM is not considering any time-of-year restrictions for non-listed species. However, the North Atlantic right whale (NARW; an ESA-listed species) time-of-year restrictions would overlap with most Atlantic cod spawning timing and could serve to reduce impacts. In addition, Appendix H (Tables H-2, H-3, and H-4) includes mitigation measures that could be imposed on the developer to reduce impacts during construction, operations and maintenance (O&M), and decommissioning.
Support for conclusions - We recommend BOEM thoroughly review the rationale for each impact level conclusion to ensure conclusions are fully supported by the text and the best available information. Impact determination should also be consistent with the definition of the impact conclusion. For example, many impacts are considered negligible despite the text providing supporting rationale for measurable project impacts.	Thank you for your comment. Impact-level conclusions are supported throughout the text, and the best available information is used.

NMFS Comment	Response
Missing analyses - There continue to be important analyses and conclusions that are absent from the DEIS. We continue to encourage BOEM to include an analysis of impacts to shoreside support services and fishing communities due to changes to fishing operations resulting from the proposed action. Additionally, there is no analysis on the potential impacts from wind wake effects or invasive species colonization; invasives are only discussed in the context of ballast water.	The importance of the commercial fishing industry to shoreside services and industries is acknowledged, as there are a variety of ports and shoreside businesses within this area. To that end, the analysis includes an extensive analysis of commercial fishing revenue exposure within the Lease Area. In addition, for the Final EIS, two additional tables have been included to outline and present revenue exposure by both Port and State to better articulate the potential impacts related to the Proposed Action. Invasive species are discussed in the finfish and benthic sections, and analysis has been expanded beyond just ballast water. Potential impacts caused by wind wakes are included in the finfish section of the EIS in Section 3.10.5.2.2, *Offshore Activities and Facilities, Presence of Structures*.
Document inconsistencies - The level of analysis by project area and resources is inconsistent throughout the document. Some sections have more thorough evaluations, but those analyses do not always align with the impact conclusion; while other sections are much more limited in the analysis of potential project impacts. All anticipated impact producing factors (IPFs) should be fully analyzed for each resource area. Inconsistencies between information in the DEIS and the MMPA application provided by Sunrise Wind to NMFS remain and should be resolved in the FEIS.	The overall document has been revised to improve consistency and include impact-level determinations for each section. It is reasonable to base the level of analysis on the combination of the likelihood of an impact occurring and the relative potential for harm from that impact.
Mitigation measures - We recommend the FEIS analyze and describe the anticipated impacts of the proposed action, mitigation measures considered to be part of that action, the effectiveness of these measures, the expected impacts if mitigation methods are applied, as well as the likelihood that such measures will be required and implemented. This structure is important to clarify the final impact	In the Final EIS, a mitigation and monitoring section has been added to the end of each section. All APMs are considered part of the Proposed Action. Additional mitigation measures are listed at the end of each section and within Appendix H (Tables H-2, H-3, and H-4) that would be considered for implementation if the Project is approved.

NMFS Comment	Response
determinations. While Appendix H lists possible additional mitigation measures, these measures are not all analyzed in the DEIS. The DEIS still contains sections where BOEM is relying on mitigation measures to reduce impacts, but does not specify which of these measures, if any, are factored into the impact determination. In addition, assumptions about the success of mitigation measures are made despite a lack of evidence or adequate detail regarding specific mitigation measures (i.e., fisheries and resource survey impact mitigation).	
Significance Criteria - The significance criteria for some resources, in combination with the defined area of analysis for each resource, do not fully consider variations in the intensity or scale of impacts and how these factors may affect resources at the project, regional, or population levels. The importance of the seasonal timing or temporal duration of impacts to resources is not clearly explained through the significance criteria or applied to the analysis. In these instances, the analyses do not provide a clear picture of what the effects of those spatial impacts and temporal losses mean for NOAA trust resources and the communities that rely on them. Consideration of both the scale and intensity of impacts in the definition and application of the significance criteria would allow for accurate impact conclusions and provide clear distinctions among action alternatives.	The rationale for the geographic extent of the analysis area for each resource is explained in the introduction to each Chapter 3 resource section. In general, resources with more localized impacts (i.e., benthic resources) have a smaller geographic analysis area (GAA), while the GAA for species that are highly mobile (i.e., marine mammals, sea turtles, and finfish) is broader to include the movement range of species that could be affected. Final EIS Section 3.2 defines the terminology used throughout the Final EIS to characterize the duration of impacts as short-term (effects that may extend up to 3 years), long-term (effects that may extend between 3 years and 35 years or the life of the Project), or permanent (effects that extend beyond the life of the Project). BOEM uses a four-level classification scheme to characterize the potential impacts of the alternatives. Resource-specific impact level definitions are presented in each resource section, and the impacts of each alternative align with the appropriate impact level, as supported by the analysis.
Geographic analysis area - Overall, the DEIS does not appear to capture what the effect of the project will be on resources within the Southern New England region, including project-specific and cumulative effects to Cox Ledge. The DEIS should analyze project impacts within the bounds of an appropriate	The GAA is defined by the anticipated geographic extent of impacts for each resource. For the mobile resources—bats, birds, finfish and invertebrates, marine mammals, and sea turtles—the species potentially affected are those that occur within the area of impact of the Proposed Action. The GAA for these mobile resources is the general range of the species that could

NMFS Comment	Response
geographic scale to allow for a meaningful understanding of effects to each resource from IPFs of the project. A geographic analysis area that is too broad may not predict the direct and indirect effects of the proposed action on a finer scale defined by the IPF.	traverse the Project footprint. The purpose is to capture the cumulative impacts on each of those resources and the entire populations that could be affected by the Proposed Action, as well as the impacts that would still occur under the No Action Alternative. Impacts from the Proposed Action impact-producing factors (IPFs) and cumulative activities are evaluated using the significance criteria defined in Section 3.3, which consider the potential for population-level impacts. Where applicable, the Final EIS discloses localized impacts (e.g., to Cox Ledge) from IPFs; however, those impacts are also evaluated in the context of the broader resource extent within the GAA.
Cumulative Analysis - The cumulative analysis in the DEIS is very general and does not provide a meaningful analysis of how this project, in combination with adjacent projects in development and proposed on Cox Ledge, will impact the resources in Southern New England. While the cumulative analysis includes areas beyond Southern New England, the effects to this specific region from large scale development are not analyzed in the document– a gap which should be addressed in each offshore wind project's EIS.	Thank you for your comment. The cumulative sections have been expanded and analyzed with more detail within the Final EIS.
NOAA Scientific Surveys - We continue to have significant concerns related to the major impacts offshore wind development will have on our NOAA scientific surveys. The DEIS does not include any discussion on how these major impacts will be mitigated at the project level other than referencing the ongoing BOEM/NMFS survey mitigation efforts. However, the mitigation strategy is not currently resourced and does not set requirements or standards with which projects must comply. In order to minimize the major adverse impacts expected on scientific surveys, we recommend mitigation measures be required and implemented before development moves forward, consistent	Thank you for your comment. BOEM will continue to work with NOAA regarding mitigation measures for this Project.

NMFS Comment	Response
with our joint survey mitigation efforts. We will continue to work with you to ensure these details can be included in the FEIS.	
The table reads that impacts described do not include mitigation measures despite mitigation measures being included in the COP, but NMFS understands that the impacts in the analysis in Chapter 3 incorporate mitigation. Please edit the table title accordingly. If impacts do not incorporate mitigation, this approach is inconsistent with other OSW EISs.	The text has been updated; mitigation measures are included in the analysis.
Please edit the sixth paragraph in this section to reflect the following agreed upon language, "In addition, the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) anticipates one or more requests for authorization under the Marine Mammal Protection Act (MMPA) to take marine mammals incidental to construction activities related to the Project. NMFS' issuance of an MMPA incidental take authorization would be a major Federal action connected to BOEM's action (40 CFR 1501.9(e)(1)). The purpose of the NMFS action—which is a direct outcome of Sunrise Wind's request for authorization to take marine mammals incidental to specified activities associated with the Project (e.g., pile driving)—is to evaluate Sunrise Wind's request pursuant to specific requirements of the MMPA and its implementing regulations administered by NMFS, considering impacts of the applicant's activities on relevant resources, and if appropriate, issue the permit or authorization. NMFS needs to render a decision regarding the request for authorization due to NMFS' responsibilities under the MMPA (16 U.S.C. 1371(a)(5)(A) & (D)) and its implementing regulations. If NMFS makes the findings	The text has been updated as suggested.

NMFS Comment	Response
necessary to issue the requested authorization, NMFS intends to adopt, after independent review, BOEM's environmental impact statement (EIS) to support that decision and fulfill its National Environmental Policy Act (NEPA) requirements."	
Please include a short explanation at the end of the paragraph about whether the list of activities in Appendix E has been developed for this specific project, or whether this same list of activities was developed for and is being included for all OWS projects in the Atlantic, regardless of project location, scale or details. Please also see related comment in Appendix E. This issue has also been identified by NMFS in CVOW, Ocean, Empire, and Mayflower.	The list of activities in Appendix E has been updated specifically for the Sunrise Wind Project.
The purpose and need states that the project's agreement with NYSERDA is to deliver 880 MW with the ability to deliver up to 924 MW, but all presented alternatives rely on meeting a maximum output of 1034 MW. The document only includes consideration of the installation of 94 turbines for a total generation of 1034 MW. However, approximately 80 to 84 turbine locations would be necessary to meet the existing agreement of 880 MW to a maximum of 924 MW, which could presumably reduce impacts to resources in the lease area. The document does not provide any justification as to why an alternative meeting the OREC of 880 - 924MW, without additional excess capacity, would not be reasonable. We continue to recommend that the document consider additional alternatives designed to further reduce impacts to sensitive habitats in the project area (i.e., Atlantic cod spawning habitats and complex habitats associated with Cox Ledge) using layouts that would still meet the applicant's agreements.	Alternative C-3 has been added and considers fewer WTG positions.

NMFS Comment	Response
Please add the following sentence to the end of the paragraph: "If a mitigation measure was analyzed in the impacts analysis for the selected alternative and that measure influenced the impact determination for a particular resource, that measure will be included as a term and condition." Any mitigation and monitoring terms that influence the impact conclusions need to be committed measures in order for the assumptions and conclusions of the analysis to be accurate.	Text has been added to Section 3.2.
This section describes the project area as "generally homogeneous sandy/soft substrate typical of the region". However, this project overlaps with the south end of Cox Ledge and includes complex habitat throughout the lease. When describing the region, this section should also discuss the complex habitats and benthic features in Southern New England, including Cox Ledge so the reader can have an accurate understanding of the benthos in and around project area.	Please see Figure 2.1-6, which displays the location of Cox Ledge in relation to the Sunrise Wind Farm (SRWF). Surveys have determined that Cox Ledge is approximately 5 to 10 kilometers (km; 3.1 to 6.2 miles[mi]) north of Priority Area 1, which is the area closest to the ledge terminus. Each portion of the benthic habitat surveyed is described in greater detail in Sections 3.7.1.1 through 3.7.1.7. Table 3.7-1 summarizes the sampling results, including dominant substrate and common taxa observed to further characterize the types of habitats surveyed within each Project component area.
Under presence of structures, it would be useful to discuss how the hydrodynamics in Southern New England may be affected by the presence of structures, including tidal fronts in SNE (e.g. Nantucket Shoals). This section should also include an analysis of impacts from invasive species colonization and changes to the surrounding benthos (i.e. increased in organics) as a result of the presences of structures. These analyses are missing from the DEIS and we recommend they be included in the FEIS.	Thank you for your comment. Information on the influence of wind turbines/structures on the hydrodynamic conditions within an offshore wind farm is included in Section 3.5.5.2, *Water Quality*, and has been added to 3.10.5.2, *Finfish, Invertebrates, and Essential Fish Habitat*, and Section 3.11.5.2, *Marine Mammals*. Further discussion on invasive species is provided in Section 3.7.5.2.2 of *Benthic Resources* and Section 3.10.5.1.2 of *Finfish, Invertebrates, and Essential Fish Habitat*.
Under the noise section, there are several statements related to the duration of impacts that are unsupported. For example, it states that noise from pile-driving that causes behavioral changes could affect the same populations or individuals	Noise levels (calculated by NMFS's *Multi-Species Pile-Driving Calculator Tool*) and the criteria for sensitive fish species were used for this EIS. An individual may be affected multiple times during the installation of a WTG or during a maintenance activity. The impacts are expected to be minor to moderate

NMFS Comment	Response
multiple times in a year or in sequential years, but then concludes the impacts would be minor. Please clarify how the impact level determination was made.	because the noise and vibration would dissipate rapidly in the soft sediments. The text was revised in Section 3.7.3 as there was an error.
This section only appears to discuss invasives in terms of ballast water. However, habitat disturbance, particularly disturbance of natural hard bottom, and the presence of new structures can also lead to colonization by invasives. We recommend this be discussed and analyzed.	Updated information was added under Sections 3.7.3 and 3.7.5.
We recommend including a project schedule in this section with a discussion of how benthic resources may be affected based on the time of year the activity is occurring.	The Project schedule is included in Chapter 2. The effects due to the timing of activities were discussed in Section 3.7.5.
Under noise and vibration, there are no supporting citations from literature (grey or peer-reviewed) to support any of the statements made. The analysis should include a discussion of both sound pressure and particle motion as well as substrate vibration in relation to pile driving.	Thank you for your comment. The numbers provided were from NMFS's *Multi-Species Pile Driving Calculator Tool*. However, since the Draft EIS, several citations have been added to support the analysis.
The following statement should be clarified, "Since the ICW is dredged periodically to facilitate vessel traffic, the level of disturbance from the HDD would be negligible in comparison". This section should evaluate the activities and effects from this project consistent with impact level definitions, rather than making conclusions based on comparisons with other activities.	The channel is dredged periodically to accommodate vessel passage, which means it is disturbed to a greater degree than the actions proposed by the Project, which would use subsurface directional drilling. Therefore, the comparison attempts to place the Proposed Action in the context of other ongoing activities with known effects on the site. Explanatory text was added to Section 3.7.5.1.1.
Please provide an analysis of the effects of leveling sand ripples.	Discussion of the effects of sand wave leveling in Section 3.7.5 includes direct adverse impact information.
The following statement should be deleted: "On request from NOAA Habitat, sand and mud habitats with boulder fields that were previously cross walked to the "heterogeneous complex"	Each portion of the benthic habitats surveyed is described in greater detail in Sections 3.7.1.1 through 3.7.1.7. Table 3.7-1 summarizes the sampling results, including dominant substrate and common taxa observed, to further

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category, were cross walked to "complex." The document should clearly describe the habitats in the project area, based on both the broader mapping categories and the samples.	characterize the types of habitats surveyed within each Project component area. This statement relates to how the habitats were classified to facilitate impact estimation and comparing areas of priority habitats based on the level of complexity. The survey results are also included in Sections 3.7.1.1 to 3.7.1.7.
Relocating boulders would be a permanent change to benthic habitat. The potential effects of this should be analyzed in detail. Please clarify whether there are plans to create boulder aggregations. If the creation of boulder aggregations is planned, there should be an in-depth consideration of the potential effects.	Sunrise Wind plans to relocate boulders in a specific sub-area of the 220-meter (m; 722-feet [ft]) radius. The decision to move boulders was made after conducting pre-construction surveys at the site that provided information on the relevant area for installation and operation. Boulders up to approximately 2.4 m (7.9 ft) in diameter would be moved using a boulder grab. The goal would be to move boulders as little as possible, and there is currently no plan to create boulder aggregations. (January 2023 Boulder Relocation Plan- Sunrise Wind 2023a).
Please provide a citation for the following sentence: "Other species that may benefit from the increased hard substrate, which would exhibit zonation with depth, include sea anemones and other anthozoans, bivalves such as horse mussel (*Modiolus modiolus*) and blue mussel (*Mytilus edulis*), green sea urchin (*Strongylocentrotus droebachiensis*), barnacles, hydrozoans, sponges, and other fouling organisms."	Degraer et al. (2020) was cited.
Please provide a citation for the following sentence: "Similar effects have been seen at offshore oil rigs where ocean communities develop and resemble those found at natural and artificial reef structures."	Hutchison et al. (2020b) was cited.
The text appears to suggest the WTG foundations are analogous to the existing complex habitats. This is based on an assumption that the rock used for scour protection is equivalent to natural, complex rocky bottom habitat, which generally is not true. Riprap typically used for scour protection	Additional text was added citing Chen et al. (2023) and Hutchison et al. (2020b) on the Block Island Wind Farm (BIWF) findings.

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is angular, engineered stone of large diameter that is not the same as small diameter cobble, gravel and rocky bottom habitats. In addition, engineered, artificial rock is known to attract greater amounts of invasive species, including tunicates, sponges, and macroalgae. While it's important to discuss the colonization of structures, this section should not suggest the habitat value is equal to the existing habitats, as this is unsupported.	
Under discharge and releases, the conclusion on impacts of the OSC-DC is unsupported. Please provide additional text and references to support any conclusions on impact determinations.	Additional text was added to support the conclusion.
In the conclusion regarding the impacts of the proposed action, please include a discussion of the permanent habitat conversion brought about by relocating boulders.	Information on how the habitat would be altered if boulders were relocated was added to Section 3.7.5.1.2.
It is unclear what geographic area and benthic resources you are considering when evaluating impacts of the specific project. There is limited discussion of the benthic resources in and around this area. Much of the discussion is in general terms, making it difficult to understand how this project may affect benthic resources in the project area and in and around Cox Ledge.	The benthic resources description is from the surveys that have been completed. Further information was added throughout Section 3.7, *Benthic Resources.*
We have concerns with how the DEIS is characterizing the Habitat Impact Minimization alternative and NMFS participation in assisting BOEM with scoping out this alternative; we recommend you provide clarifications in the DEIS. It is inaccurate to suggest that NMFS identified priority areas based on backscatter alone. The priority areas were identified by first prioritizing areas that overlap with	Text was added to Section 3.7.6 to clarify how priority areas were identified. Alternatives C-1 and C-2 are no longer feasible; however, Alternative C-3 was added, and consultation with NMFS occurred to help identify the WTG positions for exclusion.

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documented cod spawning activity, then areas that overlap with complex habitats, which were identified based on all available habitat data, including backscatter, identified boulders, and benthic samples. We recommend this alternative focus first on reducing impacts in priority area 1 and then area 2. This would reduce overlap with cod spawning activity and complex habitats, while also maintaining a continuous area free of development in these sensitive habitat areas to reduce habitat fragmentation.	
The conclusion that there would be no permanent impacts to benthic resources from the project is unsupported. The existing landscape and associated benthic resources will be permanently changed by project construction and operation, beyond the life of the project, even if there are some areas of recovery (i.e., infauna).	The statement that no impacts would be permanent is not in the Benthic Resources section. In fact, several IPFs are noted as being permanently impacted, such as the presence of structures.
We recommend you include figures of the habitat data, including backscatter and boulders, to help the reader better understand benthic resources in each project section.	Additional figures were added to Section 3.7.1 (see Figures 3.7-1, 3.7-2, and 3.7-3).
In Table 3.5.2-2 (Definition of Potential Impact Levels for Benthic Resources), it appears both moderate and major adverse may have population level effects; however, moderate are considered recoverable. It's unclear what you are considering "recoverable", and what time frame for recovery is considered here. It would be beneficial if the definitions incorporated the scale and intensity of impact to allow for a more clear distinction among the impact level definitions.	Section 3.7.2 (previously Section 3.5.2.2 in the Draft EIS) has a narrative explanation of the terms "recoverable" and "non-recoverable" that cites Popper et al. (2014).
Please provide support for the impact determination made throughout this section. Many impacts are dismissed as	Supporting information was added in the impact sections.

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negligible, despite text suggesting measurable effects. For example, under operational noise and EMF, the section discusses impacts for the life of project but then concludes the impacts are negligible; this is unsupported by the text and in some cases contrary to text provided.	
This section discusses impacts to SAV; however, the anticipated impacts and extent of area to be impacted are unclear from the description. It is our understanding that this temporary structure is not proposed in the SAV, but that is unclear from the description in the DEIS. If impacts to SAV are anticipated, then mitigation should also be described.	The Final EIS characterized the eelgrass as potentially occurring in the Project Area and noted that it was found in 2018 but has not been confirmed in a more recent survey (2022). As described in Appendix H, Sunrise Wind would provide locations of identified submerged aquatic vegetation (SAV) to contractors so they can avoid anchoring/spudding impacts to SAV. Additionally, numerous mitigations were proposed as part of the essential fish habitat (EFH) consultation with NMFS to protect SAV habitat. See Appendix H for more details on SAV mitigation and monitoring.
Page 3-103 includes a statement recognizing that "In areas with cobble and boulder habitat, the benthic organisms are not well adapted to frequent sedimentation and, therefore, may take longer to recolonize after the disturbance." However, throughout this section of the DEIS, the document suggests recovery will be short term, often suggesting 1-3 years for recovery. It should be noted that more complex habitats have much slower recovery times. Since the project area is not comprised of all the same habitat types, recovery times will vary; but this is unclear in the analysis. Additionally, the DEIS suggests that benthic resources would recover in 1-3 years after decommissioning of the project with a 30-35 year life span. Please provide support for this conclusion.	The 1- to 3-year recovery time is stated for soft sediment areas, not for all habitat types. The text was revised to reflect this more clearly.
Please include more information on EMF effects on blue mussels including Albert et al. 2022 (doi.org/10.1007/s00227-022- 04065-4); Jakubowska-Lehrmann et al. 2022 (doi.org/10.1016/j.marenvres.2022.105700)/	The Jakubowska-Lehrmann paper has a good literature review on blue mussels, but the levels of exposure were very high and not comparable to in-situ conditions. The Albert paper also used similar high exposure levels and found no effects.

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This section identifies four WTG configurations which are being labeled Alternatives C-2a, C-2b, C-2c, and C-2d. However, these are not identified as alternatives in section 2.1, nor are they fully or consistently analyzed throughout this and other sections of the document. In the Benthic Resources section, no substantive analysis is done to explain the potential difference between configurations on resources, so it is unclear how different layouts may change impacts. Our understanding is that these are not formal alternatives, but rather example layouts for alternative C-2. Please ensure these are clearly and consistently described and analyzed. We would also note that these sub-alternatives identified do not consider the concerns raised by NMFS in the scoping of the Habitat Impact Minimization Alternative. These sub alternatives focus solely on boulder density, and do not consider removal of all locations that overlap with documented cod spawning activity. We recommend BOEM prioritize removal and relocation of turbines that overlap with documented cod spawning activity, then complex habitat areas in a manner that would provide continuous undisturbed areas, and minimize habitat fragmentation. We do not recommend identifying areas simply based on boulder density alone.	As requested by NMFS, BOEM let the analysis within the EIS determine the most appropriate layout. Due to glauconite feasibility issues, Alternatives C-2a, C-2b, C-2c, and C-2d are no longer valid, so re-analysis was not included in the Final EIS. However, Alternative C-3 considers Atlantic cod data, complex habitat, and boulder density to determine the contiguous habitat for WTG removal.
The "Comparison of Alternatives" sections throughout the document (such as in 3.5.2.8) only include the three action alternatives. These sections seem intended to provide overall conclusion summaries and comparisons of cumulative effects, but do not include the No Action alternative for a full comparison of overall impacts. Please include the No Action alternative for a clearer comparison. Additionally, as described	The No Action Alternative (Alternative A) is now included in the comparison of cumulative effects.

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in a previous comment, four layouts described as "alternatives" are also provided under alternative C-2, but these do not have their own impact conclusions nor are they summarized in this table. Please ensure consistency in identification of alternatives.	
We recommend this section consider impacts in the context of habitat and benthic resources present in the project area. Much of the Benthic Resources section focuses the analysis in general terms, making it challenging to clearly distinguish between alternatives, without a more detailed description of how benthic resources within the project area differ. Incorporating additional figures such as backscatter and boulder density may also be useful so the reader has a clearer understanding of the characteristics of the project area.	Additional figures were added to Section 3.7.1 (see Figures 3.7-1, 3.7-2, and 3.7-3).
Page 3-202 appears to mischaracterize the recent action by the NEFMC and these statements should be corrected in the FEIS. The NEFMC approved an HAPC that is focused on protecting two elements - 1) complex habitats; and 2) cod spawning activity - from the anthropogenic pressure and development in Southern New England, specifically offshore wind development. To be considered for an HAPC designation, the 2002 EFH regulations (50 CFR Part 600.815(a)(8)(i)-(iv)) requires one or more of the following four criteria to be met: 1) importance of historic or current ecological function for managed species; 2) sensitivity to anthropogenic stresses; 3) extent of current or future development stresses; and/or 4) rarity of the habitat type. As described in detail in the NEFMC's Draft Submission to us dated August 22, 2022, the Council's approved HAPC meets all four of these criteria for the designation of an HAPC for Atlantic cod spawning activity and	The text was updated to better characterize recent actions by the New England Fishery Management Council (NEFMC) in Section 3.10.1, *Description of the Affected Environment and Future Baseline Conditions.*

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three of the criteria for the designation of an HAPC for complex habitat. BOEM's description of the HAPC is incorrect, as it is conflating the complex habitat portion of the HAPC with cod spawning activity. The Council's approved HAPC applies to any area where cod spawning activity is identified (based upon specified criteria) regardless of the habitat type where spawning occurs. This is particularly important to clarify as cod spawn over a variety of habitat types and use different habitat types within aggregation areas. Please revise your presentation of this Council approved to correctly describe and characterize the new HAPC.	
The following statement should be deleted, "Ongoing fishing pressures would exacerbate the impacts to fish, invertebrates, and EFH more so than construction related activities". This statement is unsupported by the text and it appears to be making an unreasonable comparison. Impacts of the proposed project construction and operation are not the same as fishing activity it is inappropriate to equate these two activities. A fisheries management process exists to address impacts to finfish, invertebrates and EFH from fishing activity.	The statement was deleted.
For anchoring, there is no supporting peer-reviewed or gray literature cited. Please provide appropriate citations.	Citations were included in Section 3.10.3.2, 3.10.5.1.2, and 3.10.5.2.2. Appendix K of the Final EIS includes a list of all references.
Please define which species are being referred to in the following sentence: “In reality, fish would be moving around, which could, for some species, lessen the impact during pile driving, which would only occur for an approximately 4-hr period each day.”	In the context of the paragraph that discusses injury thresholds for pile driving, it is stated that the thresholds assume the fish are stationary when they actually move around. These would be exposed mobile species.
Please provide a citation for the following statement, “However, acoustic masking is an environmental stressor that	Confluence (Confluence Environmental Company). 2023. Revolution Wind Farm and Revolution Wind Export Cable – Development and Operation.

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ceases as soon as the noise stops, with no lingering effects."	Essential Fish Habitat Assessment. Prepared for BOEM, Washington, D.C., by Confluence, Seattle, Washington. The in-text citation was added.
Please provide the scientific basis for the following statement given that earlier in this section (pg. 347), it is stated that cod have high spawning site fidelity: "Given the availability of similar surrounding habitat, Project activities are not expected to result in measurable impacts on spawning Atlantic cod." The top of that same paragraph states "Specifically, seafloor-disturbing activities could result in a loss of spawning habitat for Atlantic cod, as studies suggest that cod often demonstrate spawning site fidelity, returning to the same fine-scale bathymetric locations year after year to spawn (Hernandez et al. 2013; Siceloff and Howell 2013)." The conclusion is inconsistent with the information provided in the paragraph.	This sentence was deleted.
Relocating boulders would be a permanent change to benthic habitat. The potential effects of this should be analyzed in detail. The following sentence refers to boulder aggregations. Please clarify whether there are plans to create boulder aggregations. "Additionally, if relocation results in aggregations of boulders, these new features could serve as high value refuge habitat for juvenile lobster and fish that prefer structured habitat, as they may provide more complexity and opportunity for refuge than surrounding patchy habitat." If the creation of boulder aggregations is planned, there should be an in-depth consideration of the potential effects.	Since the Draft EIS was published, the Boulder Relocation Plan from Sunrise Wind was developed. No boulder aggregations are planned, although boulders will be moved as little as possible, which could result in boulders being placed near each other.
The conclusion that impacts to EFH from boulder clearance will be low is unsupported. Specifically, the paragraph that suggests hard bottom areas would rapidly recolonize and recover is not supported by the best available information.	The suggested literature was reviewed, and conclusions were adjusted.

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Below are some additional references to consider in your evaluation. Tamsett, A., Heinonen, K., Auster, P., and Lindholm, J. (2010). Dynamics of hard substratum communities inside and outside of a fisheries habitat closed area in Stellwagen Bank National Marine Sanctuary (Gulf of Maine, NW Atlantic). Auster, P. J., & Langton, R. W. (1999). The effects of fishing on fish habitat. In American Fisheries Society Symposium (Vol. 22, No. 150-187). Lindholm, J. B., Auster, P. J., & Kaufman, L. S. (1999). Habitat-mediated survivorship of juvenile (0-year) Atlantic cod *Gadus morhua*. Marine Ecology Progress Series, 180, 247-255. Auster, P. J., Malatesta, R. J., Langton, R. W., Watting, L., Valentine, P. C., Donaldson, C. L. S., ... & Babb, W. G. (1996). The impacts of mobile fishing gear on seafloor habitats in the Gulf of Maine (Northwest Atlantic): implications for conservation of fish populations. Reviews in fisheries Science, 4(2), 185-202. Lengyel, N. L., Collie, J. S., & Valentine, P. C. (2009). The invasive colonial ascidian *Didemnum vexillum* on Georges Bank- Ecological effects and genetic identification. Aquatic Invasions, 4(1), 143-152.	
When discussing sand wave leveling, we recommend this section also discuss and evaluate dredging methods proposed and plans for dredge material disposal. Currently, the document provides limited analysis on the extent of dredging proposed or potential impacts to finfish, invertebrates, and EFH.	Thank you for your comment. More information about dredging and dredging effects on aquatic organisms is included in the Final EIS in Section 3.10.5.1.2 (previously Section 3.5.5.5.1.2 in the Draft EIS).
This analysis of the artificial reef effect should include a discussion of FAD (fish aggregating device) effects; artificial reef effects; modification of the prey field for upper level predators, the potential for structures to facilitate the	Thank you for your comment. More information about the effects of artificial reefs on aquatic organisms is included in the Final EIS in Section 3.10.5.2.2.

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establishment and range expansion of non-native species. The analysis of the artificial reef effect cites only 2 peer-reviewed papers. Please provide appropriate citations to support statements made in this section. There is a growing body of knowledge on these topics and the majority of this information is missing from the analysis.	
Please provide citations for the following statement: "It has been shown in recent studies that offshore wind structures can increase the amount of habitat for invertebrates that colonize hard structure or complex benthic habitats."	Hutchison ZM, Bartley S, Degraer P, English A, Khan J, Livermore B, King JM. 2020a. Offshore wind energy and benthic habitat changes, lessons from Block Island Wind Farm. Oceanography 33(4):58-69. The in-text citation was added.
Please place the following sentence into the context of the Sunrise project: "There was a shift in community structure from aggregations of mussels and barnacles to more dense colonization by corals, hydroids, anemones, crabs, sea stars, and snails. (Causon and Gill 2018)."	Studies from the Block Island Wind Farm reported an increase in mussel beds, tunicate, and indigenous coral. This was followed by an increase in the number of abundant predators associated with the mussel communities, including moon snails, crabs, and sea stars (Hutchison et al. 2020a). The BIWF is in close proximity to SRWF, so similar changes could be expected.
Please define what is meant by "vulnerable species".	In the context in which it was used, vulnerable species are those that can be caught by sampling gear such as trawls, traps, and nets. The text was updated to reflect this more clearly.
Please provide more details on the "least squares fit" that was conducted using the data from Tougaard et al. 2020.	Least squares fit is a mathematical procedure for finding the best-fitting curve to a given set of points by minimizing the sum of the squares of the offsets ("the residuals") of the points from the curve. In this context, the least squares fit was used to demonstrate that varying wind speed results in a variation of underwater noise levels. A footnote was added in Section 3.10.5.2.2 for clarification in the Final EIS.
The DEIS should evaluate the implications for finfish, invertebrates, and EFH of a 15 MW turbine producing "SPL measured 100 m from a hypothetical 15 MW turbine in operation in 10 m/s (19 kt or 22 mph) wind would be 125 dB	The EIS will not analyze 15-MW WTGs as this capacity WTG is not part of the Project Design Envelope (PDE)/Proposed Action. Analysis of 15-MW WTGs was considered but dismissed, as discussed in Table 2.2-1. While this alternative will not be discussed in the EIS, implications for finfish,

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re 1 µPa."	invertebrates, and EFH from these larger WTGs is that high wind speeds would produce higher underwater noise.
Please characterize potential effects of operational noise on fish behavior, communication, masking, feeding, spawning, etc. over the lifetime of project operation, providing citations as appropriate.	Potential effects of operational noise on fish behavior were included in Section 3.10.5.2.2 of the Final EIS.
No rationale is provided for why sturgeon are not susceptible to impingement during operation of the OCS-DC. Additional context should be provided why impingement will not occur.	The through-screen velocity of the proposed offshore converter station (OCS-DC) is less than 0.5 feet per second (ft/s; 0.15 meters per second [m/s]). This through-screen velocity estimate is below the Environmental Protection Agency (EPA) threshold required for new facilities, defined at §125.84(c), and is therefore protective against the impingement of juvenile and adult life stages of finfish.
The only IPF mentioned in this section is noise; however, other IPFs are applicable to ESA-listed fish. The analysis presented is very brief and does not describe any potential impacts. The section is missing IPFs and associated analysis that should be considered for listed fish (i.e., habitat disturbance, vessel traffic, cable laying, pollutants/discharges, lighting, EMF, surveys/monitoring). This is consistent with prior EISs (see Ocean Wind 1). The ESA Info Needs document and prior EISs should be consulted to see the appropriate IPFs to be analyzed. Additionally, it is unclear why listed fish are mentioned above under the Discharge IPF but are not analyzed for any other IPF. NEPA impact determinations should also be used in this section instead of the ESA terminology presently used.	Additional IPFs were added to Section 3.10.5.5, *Impacts of Alternative B on ESA-listed Species*, including habitat disturbance, vessel traffic, cable laying, pollutants/discharges, lighting, electric and magnetic fields (EMFs), and surveys/monitoring.
BOEM has indicated that the BA to support the ESA consultation will be included as an appendix to the FEIS. In the event that the BA is not included as an appendix, we	Content from the *Sunrise Wind Farm and Sunrise Wind Export Cable - Development and Operation Biological Assessment* (Biological Assessment) is included in the Final EIS. For additional specific information, please review

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recommend that a summary of the findings of the BA be provided in the FEIS.	the Biological Assessment document.
Page 3-202 states that SAV "does not occur within the footprint of the SRWF or SRWEC, nor its immediate vicinity"; however, this is contrary to information in the benthic section that appears to suggest SAV may be impacted. Additionally, later in the document on page 3-218, it appears to suggest 1.7 acres of SAV will be impacted. That was not our understanding and recommend you clarify this statement in the document. Information from Orsted's recent SAV survey should be incorporated and the proximity to SAV and potential impacts should be clearly and accurately described. Additionally, the description of potential impacts to SAV from a frack-out during HDD activity is not supported; specifically the conclusion that these impacts would be minimal and short-term should this adverse effect occur in and SAV bed. Based on information related to SAV recovery, we would anticipate long-term to permanent impacts that would require compensatory mitigation.	Section 3.10.1.3 was updated to reflect that SAV was found within the Intracoastal Waterway (ICW) - horizontal directional drilling (HDD) route.
Throughout this section, the DEIS suggest impacts to all habitat types, including complex habitats are short-term in nature. This is not supported by the best available science which indicates that disturbance to complex habitats result in longer recovery times. The document only appears to cite one study cited that also identifies colonization of invasive species on disturbed complex habitats from anchor scarring. On page 328, this section describes how degradation to sensitive habitats such as SAV and hard bottom could result in long-term to permanent impacts. Despite these habitat being present in the project area, impacts are often described as	BOEM considered how impacts may vary by habitat type (i.e., longer-term impacts for complex habitats) and resources present in the Project Area. These are described throughout Section 3.10 *(Finfish, Invertebrates, and Essential Fish Habitat*), specifically in the following subsections: • Section 3.10.3.2 Cumulative Impacts of the No Action Alternative Anchoring • Section 3.10.3.2 Cable emplacement/maintenance • Section 3.10.5.1.2 Offshore Activities and Facilities Seafloor disturbance • Section 3.10.5.2.2 Offshore Activities and Facilities, Presence of structures

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negligible to minor and short-term. We recommend the analysis consider how impacts may vary by habitat type and resources present in the project area.	• Section 3.10.5.4 Cumulative Impacts of the Proposed Action, Anchoring • Section 3.10.5.4 Cumulative Impacts of the Proposed Action, Presence of structures
We recommend the DEIS analyze impacts to Atlantic cod spawning activity from seabed preparation of cable installation. This is a significant omission and we recommend it be included in the FEIS.	BOEM has included an analysis of impacts to Atlantic cod spawning activity from seabed preparation of cable installation.
The section on EMF, noise and port utilization describes measurable effects to fish species and EFH, however, the EIS concludes impacts from these IPFs will be negligible. In some cases, impacts are considered short term and negligible despite contrary information provided in the text. These conclusions are unsupported and inconsistent with the impact level definition for "adverse negligible" impacts.	Impact determinations for the IPFs mentioned have been reconsidered and updated accordingly in the conclusions section for each alternative.
The document only considers invasive species impacts in the context of bilge water. However, colonization of invasive species may also occur from seabed disturbance and/or newly available substrate. The analysis of potential affects from these IPFs are missing from the document and should be analyzed in the DEIS.	Information regarding invasive species colonization has been added to Section 3.10.5.
For accidental release and discharge, there is no supporting peer-reviewed literature cited. Please provide appropriate citations.	References have been added to Section 3.10.5.1.2.
The analysis of noise lacks a discussion of substrate vibration effects on early life stages. Also, the discussion of how noise interacts with behavior and communication particularly during	Information from Sigray et al. 2022, Jong et al. 2020, Siddagangaiah et al. 2022, Stanley et al. 2020, Solé et al. 2022, and Hawkins 2022 have been added to Section 3.10.5.

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spawning should have a deeper analysis that includes the following literature: de Jong et al. 2020, https://doi.org/10.1007/s11160-020-09598-9; Siddagangaiah et al. 2021, doi: 10.1002/rse2.231; Stanley et al. 2020, doi.org/10.1242/jeb.219683. The discussion on particle motion should additionally include more recent work by Sigray et al. 2022, (doi.org/10.1016/j.marpolbul.2022.113734); Sole et al. 2022 (doi.org/10.1016/j.envpol.2022.119853); Hawkins 2022 (doi.org/10.1121/10.0013994).	
As highlighted in our letter, the best available information should be used to evaluate impacts related to cod spawning activity in the project area. This best available information highlights the overlap with the project area and cod spawning activity and confirms the importance of November and December for spawning activity in this area. The document appears to downplay or minimize the results of studies conducted in the project area. The conclusion that overall impacts of construction noise would be minor from the proposed project is unsupported by the analysis provided in the text and by the best available information.	Results of studies in the Project Area were not available when the Draft EIS was published but have since been added to Section 3.10.1.3, *Essential Fish Habitat* in the Final EIS.
Please clarify if the developer plans to avoid the conditions described in the following sentence: “Noise impacts from impact pile driving could be greater if pile driving occurs in spawning habitat, occurs during peak spawning periods, and/or results in reduced reproductive success in one or more spawning seasons, which could result in long-term effects to populations if one or more-year classes suffers suppressed recruitment.”	Mitigation measures such as these will be determined through the EFH consultation and may become a condition of Construction and Operations Plan (COP) approval.
Please review the scientific literature on the topic of hydrodynamic effects and include appropriate citations	The literature was reviewed, and hydrodynamic effects were assessed in the Final EIS.

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including. Christiansen et al. 2022 (doi.org/10.3389/fmars.2022.818501); Daewel et al. 2022 (doi.org/10.1038/s43247-022-00625-0), Dorrell et al. 2022 (doi.org/10.3389/fmars.2022.830927); and Floeter et al. 2022 (doi.org/10.3389/fmars.2022.884943). Please include in your analysis the potential impacts on larval transport.	
Please provide the more recent literature on EMF interactions in the analysis of EMF during operation including: Albert et al. 2020 (doi.org/10.1007/s00227-022-04065-4); Jakubowska-Lehrmann et al. 2022 (doi.org/10.1016/j.marenvres.2022.105700); Cresci et al. 2022 (https://doi.org/10.1093/pnasnexus/pgac175); Harsanyi et al. 2022 (https://doi.org/10.3390/jmse10050564).	More recent literature on EMF was included in the Final EIS.
This section discusses discharge from the OCS-DC, but it does not discuss the potential impacts cod spawning activity or early life stages. It should be recognized that the location overlaps with and is adjacent to areas of Atlantic cod spawning activity	The OCS-DC hydraulic zone of influence (HZI) is highly localized and does not extend within 15 ft (5 m) of the pre-installation seafloor grade or 98 ft (30 m) of the surface. Only eggs and larvae that enter the localized HZI would be susceptible to entrainment. A conservative annual estimate of Atlantic cod entrainment Is 34,239 organisms. To put this potential entrainment rate in context, a large female Atlantic cod is capable of producing 3 to 9 million eggs annually. This calculation, in terms of equivalent adults, is that 16 adult Atlantic cod could be impacted annually by the OCS-DC.
The overall conclusion of “negligible to moderate impacts on finfish, invertebrates and EFH” is heavily reliant on an expectation that the artificial reef effects will be beneficial. The aggregation of some fish species around structures would be a local increase in abundance; there is no evidence to suggest that production will increase, even locally. Aggregates of reef-associated individuals may gain habitat and food resources but would be vulnerable to predation and fishing pressure. Further, species and life stages that utilize soft	Additional information on the benefits and impacts of artificial reefs was added.

NMFS Comment	Response
bottom habitats would likely not benefit from the addition of structures and may instead experience adverse effects.	
While the section adds some text about Cox Ledge and Atlantic cod spawning activity, there is limited analysis of impacts to these resources. This limited analysis makes it difficult for the reader to understand all potential consequences of the project on complex habitats and cod spawning activity. We recommend the FEIS include a more thorough analysis of all potential effects to cod spawning activity and associated habitats and identify measures to avoid, minimize and mitigate adverse impacts from the project.	New information has been collected on Atlantic cod spawning since the Draft EIS was completed. An analysis of all potential consequences on complex habitat and Atlantic cod spawning and associated habitats has been updated, as have measures to avoid, minimize, and mitigate adverse impacts.
It appears the project level impacts are being evaluated under the same geographic area (GAA) as the cumulative effects analysis, which encompasses the Scotian Shelf, Northeast Shelf, and Southeast Shelf Large Marine Ecosystems. The geographic scope is too large to evaluate impacts of the project. As a result, it is challenging to understand impacts of the project on Cox Ledge and in the context of resources in the Southern New England Area. We recommend project level impacts be bounded by the extent of area impacted under each Impact Producing Factor (IPF). We also recommend the cumulative analysis also discuss anticipated effects of ongoing and foreseeable projects on resources in the SNE region.	The GAA varies according to the anticipated geographic extent of impacts for each resource. The purpose is to capture the cumulative impacts on each of those resources that would be affected by the Proposed Action as well as the impacts that would still occur under the No Action Alternative. Impacts from both the Proposed Action IPFs and from cumulative activities are evaluated using the significance criteria defined in Section 3.3, which consider the potential for population-level impacts. Where applicable, the EIS discloses localized impacts (e.g., to Cox Ledge) from IPFs. However, those impacts are also evaluated in the context of the broader resource extent within the GAA.
Habitat types found in the project area are variable and include soft sediments as well as complex habitats, including pebbles, cobbles and boulders. Recovery of habitat varies by habitat type, with recovery time increasing with increased	Analysis was considered in the context of different habitat types.

NMFS Comment	Response
complexity.	
Despite the different habitat types anticipated to be impacted, the document comes to the same conclusions, often that impacts are short-term and negligible. This is not supported in the DEIS, and is inconsistent with the best available information.	Analysis was considered in the context of different habitat types.
Throughout the document, there are examples where measurable impacts to resources are described, yet the document concludes a "negligible impact"; this is inconsistent with impact level determination definition. We recommend the analysis consider project effects in the context of different habitat types and resources found in the project area and that impact conclusions be supported by the text.	The analysis considered Project effects in the context of different habitats and resources found in the Project Area, and the text supported the impact conclusions.
This section provided limited analysis of impacts to finfish and EFH from operation of the converter station and associated open loop system. Additional analysis should be included, particularly associated with impacts to cod spawning activity and early life stages (eggs and larvae). The proposed location of the converter station overlaps with, and is located adjacent to, areas of spawning activity. We recommend the FEIS evaluate mitigation measures to reduce impacts to finfish and EFH from the converter station, including relocation of the converter station.	The design of the facility included mitigation measures to reduce impacts from the converter station to finfish and EFH. The OCS-DC was designed to have a through-screen velocity of 0.43 ft/s (0.13 m/s; this is below the threshold required for new facilities, defined at §125.84(c)) and is therefore protective against the impingement of juvenile and adult life stages of finfish. Accordingly, only the species with egg or larval life stages present in the vicinity of the OCS-DC would be susceptible to entrainment. The water depth of the intake pipe openings (approximately 30 ft [10 m]) above the seafloor was selected to minimize entrainment of ichthyoplankton and to take advantage of the cooler water temperatures found at depth to minimize water withdrawal volumes. The intake pipe will be equipped with a variable frequency drive (VFD). The VFD technology allows the cooling water intake of the OCS-DC to be optimized as it relates to minimizing water withdrawals as power output and source water temperature vary temporally. Each of the intake pipes would have two coarse filters consisting of a Super Duplex stainless steel vertical housing that encases a series of three banks of wedge wire filter tubes designed to filter suspended solids

NMFS Comment	Response
	and organisms larger than 500 microns. The HZI is highly localized and does not extend within 15 ft (5 m) of the pre-installation seafloor grade or 98 ft (30 m) of the surface. Only eggs and larvae that enter the localized HZI would be susceptible to entrainment; species whose ichthyoplankton are buoyant or benthic would not be affected.
Several IPFs are not analyzed when considering operational impacts of the project and we recommend they be included in the FEIS; including an analysis of risk for invasive species colonization from habitat disturbance and the introduction of new artificial substrates, as well as impacts to finfish, invertebrates and EFH from wind wake and hydrodynamic effects, including impacts to egg and larval distribution.	The IPFs from operational impacts, impacts from wind wake, and hydrodynamic effects on finfish and invertebrates were included in Sections 3.7 and 3.10. The text includes impacts on egg and larval distributions.
Please see our comments on Appendix D regarding the determination of the GAA bounds for marine mammals. Please explain why the area is limited to "most movement of a majority of species" and does not encompass all movement of all species. Because this GAA is the basis for quantity and location of the activities listed in Appendix E, which is a major component of the cumulative effects analysis, an explanation for this approach is important. NMFS has also identified this issue in CVOW, Empire Wind, Mayflower, and Ocean Wind, and NE Wind.	NEPA analysis requires a consideration of the GAA where the Project will have direct or indirect effects. BOEM's approach is consistent with NEPA requirements as well as the 'action area' based approach associated with the Endangered Species Act. Basing the GAA on animal movement instead of Project impacts would require the overall GAA to include potentially all of North and South America, Western Europe, Greenland, Northwestern Africa, the North and South Atlantic, the Arctic Ocean, the Gulf of Mexico, the Caribbean, and the Mediterranean.
The No Action Conclusions section makes impact determinations on the baseline conditions of marine mammals. However, it is missing an impact determination on not approving the COP (i.e., the incremental impact of taking No Action). NMFS advises adding a paragraph along the lines of the following: Under the No Action Alternative, BOEM would not approve Sunrise Wind's COP. Hence, stressors from construction, operation, and maintenance of the Sunrise	This edit was incorporated in Section 3.11.3.4.

NMFS Comment	Response
Project would not occur. Baseline conditions of the existing environment would remain unchanged. Hence, not approving the COP would have no additional incremental effect on marine mammals. Similarly, NMFS No Action alternative (i.e., not issuing the requested incidental take authorization) would also have no additional incremental impact on marine mammals and their habitat.	
"Traffic" section. Please provide updated information and source for North Atlantic right Whale vessel strikes.	Sections 3.11.5.1.2 and 3.11.5.2.2 were updated with this information.
"Lighting" section. Very little information is given as to the different types of added artificial light sources and how marine mammals will react to them. Please provide more detail to support the conclusion that artificial lighting is anticipated to be negligible. Make updates in associated Lighting section in Alternative B.	Section 3.11.4.2.2 was updated to include lighting characteristics and additional analysis regarding potential effects.
"Presence of structures" section. Please provide a source for broader effects on oceanic conditions (Dorrell et al, Christiansen et al).	Consideration of potential effects on regional oceanic/hydrodynamic conditions was added to the Final EIS along with the appropriate citations for both the No Action Alternative and the Proposed Action.
Please provide mitigation measures, or state that proper mitigation measures will be in place to avoid the potential for PTS to occur in NARWs. The EIS will need to state that while the exposure modeling predicts a small potential for PTS, there are enhanced mitigation and monitoring measures in place to avoid PTS. Update the associated G&G Survey section for O&M.	BOEM and Sunrise Wind will be required to submit a Pile Driving Monitoring Plan to NMFS and BSEE for review and concurrence at least 180 days prior to the start of pile driving. This will include requirements for Protected Species Observer (PSO) coverage, sound field verification, finalized shutdown zones, reporting requirements, and the Nighttime Pile Driving Monitoring Plan. This information is detailed in Appendix H.
Please provide a source for the following information. "Although vibratory pile-driving noise can cause behavioral effects at greater distances compared to impact pile-driving noise, the overall sound levels are less intense and less likely	An updated analysis has been provided using NMFS's 2022 *Multi-Species Pile Driving Calculator Tool* for the isopleth of potential impacts, along with relevant citations. The following reference was included: National Marine Fisheries Service (NMFS). 2022. Multi-Species Pile Driving Calculator Tool.

NMFS Comment	Response
to cause injury. Low-frequency cetaceans would have to remain within 16 ft (4.9 m) over an entire day of vibratory pile driving during temporary cofferdam installation to experience permanent hearing injury, while high-frequency cetaceans would need to remain within less than 591 ft (180.1 m) from the cofferdam installation for an entire workday to experience hearing injury. Phocid pinnipeds would need to remain closer than 34 ft (10.4 m) from cofferdam installation to experience hearing injury."	Version 1.2. Excel file. Updated August 2022. [accessed 2022 Oct 15]. https://www.fisheries.noaa.gov/resource/data/multi-species-pile-driving-calculator-tool.
Please confirm that the statement "collision-related effects on marine mammal species from the proposed project are negligible" includes risk to the North Atlantic Right Whale.	This edit was incorporated in Section 3.11.5.1.2.
This section cites a paper that observed clear, long term displacement of harbor porpoises from a wind area in Denmark. The following paragraph then states that based on the above information, the presence of visible structures from the proposed action would be short term. Please clarify or expand on this conclusion.	Section 3.11.5.2.2 was updated for consistency.
The following statement needs to be revised here and each time it occurs in the marine mammal section, as it makes an ESA determination that would only be made in a NMFS biological opinion: "we anticipate that the Proposed Action for the SRWF Project are likely to adversely affect, but not jeopardize the continued existence North Atlantic right, sei, fin, or sperm whales." A preliminary determination may be made by an action agency in a biological assessment but the final determination is made by NMFS. NEPA impact definition terminology should be used instead.	The text was changed to use NEPA impact definition terminology.

NMFS Comment	Response
The current body of literature does not support the minor beneficial impact determination used for presence of structures. Structures may provide additional foraging opportunities for some marine mammal species but also may increase the potential for fishery interactions. Presence of structures may also disrupt aggregations of planktonic prey for certain marine mammal species. Additionally, it is unclear how impacts from Project O&M would occur for a lesser extent and duration given the operational phase of the project is ~30 years compared to ~3 years for construction. This conclusion section should be revised.	Thank you for your comment. This comment appears to support the existing determination as it points out the mixed potential for both negative and beneficial impacts, which is described in the analysis for the presence of structures. The potential for impacts to planktonic prey resources for certain whale species is described in the analysis and is anticipated to have negligible impact. Analysis for the presence of structures was not parsed between construction and O&M. Instead, the analysis was consolidated with the analysis of impacts from the O&M phase. The conclusion was intended to describe that there is a potential for short-term displacement. The conclusion has been updated to remove the consideration of short-term effects because there is also the potential for long-term, minor displacement effects to some species in addition to long-term, minor beneficial effects on the distribution, abundance, and availability of prey and forage resources for other species.
The Cumulative Impacts of the Proposed Action section states that ''population-level effects would not be expected for most species. The exception to this is the North Atlantic right whale, due to the small size of its population and frequent occurrence in shallow coastal zones.'' The very next section, Proposed Action on ESA Listed Species, concludes that "the Proposed Action for the SRWF Project is likely to adversely affect but not jeopardize the continued existence of North Atlantic right, sei, fin, or sperm whales.'' These two statements are contradictory. Please clarify.	Endangered Species Act (ESA) determinations were removed, and more clarity was provided in separate determinations for NARW versus other listed species.
General: NMFS is currently working with BOEM to develop a FEIS for Ocean Wind 1 that will be sufficient for NMFS' adoption needs. Please incorporate all improvements to the OW1 FEIS in the Sunrise FEIS.	The Ocean Wind Final EIS was used to inform updates to this Final EIS.

NMFS Comment	Response
General: NMFS continues to recommend that impact conclusions for marine mammals are not lumped but, for all Alternatives, are partitioned out by NARWs, other mysticetes, odontocetes and pinnipeds with supporting analysis for each group included.	Impact level determinations were parsed out into marine mammal groups (mysticetes, odontocetes, and pinnipeds), with separate impact level conclusions for NARW where appropriate.
NMFS had previously commented that UXO detonation was missing from No Action impacts, and we have concerns that our previous comments were not addressed in the DEIS. This section is about future planned projects wherein developers are proposing to detonate UXOs. Developers have requested, and NMFS has proposed to authorize Level A harassment and Level B harassment of marine mammals incidental to UXO detonation (see OW1 and Revolution Wind rules). We again recommend impacts associated with UXO detonation be included in the analysis to ensure an accurate description of impacts from future planned projects.	A UXO detonation IPF was added to the No Action Alternative.
The FEIS should include information contained within Sunrise Wind's updated density and take estimation memo. NMFS received this on December 15, 2022. We are not aware of when BOEM received it but it would have been around that time.	The updated density estimates were added based on Duke model updates in June 2022 and are provided in Table 3.11-2, “Abundance Estimates of Marine Mammals Expected to Occur in the Proposed Project Area.”
According to NMFS PACM website, there was one definite acoustic detection of a blue whale in close proximity to the lease area in 2013 and one possible detection last year; therefore we agree that it would be unusual for blue whales to occur near the lease area. However, because the developer has requested, and NMFS proposes to authorize a very small amount of take for this species, and given that NMFS is using this EIS to satisfy NEPA, please add a statement indicating that blue whale are not likely to occur near the project; however,	Blue whales were added for consistency with the determinations made in NOAA’s proposed Letter of Authorization under the Marine Mammal Protection Act (MMPA).

NMFS Comment	Response
Sunrise has requested and NMFS proposes to authorize a very small amount of take of blue whales. The MMPA does not contain a "reasonably expected" standard and we request there be recognition of the developer's request and NMFS' action in this EIS.	
Citations for the thresholds listed should be included for Table 3.5.7-3.	The threshold citations were added to the Final EIS in Section 3.12.3.2.
Please include/list some 'other disturbances' that are referenced.	Vessel traffic and drone operation were added to the statement referencing 'other types of disturbances'.
It appears the Traffic and Lighting IPFs are intermingled in the same paragraph. This should be revised for clarity in the FEIS. Additional information should be provided regarding the frequency and severity of vessel strikes anticipated and which sea turtle species are expected to experience serious injury or mortality. This information is necessary to support the conclusion that there will be no population level effects. A regional vessel traffic analysis is not needed to describe these impacts, there is information in project COPs and BAs that can support this analysis.	Possible vessel impacts from lighting impacts for this section were separated. The agency responsible for monitoring and reporting marine mammal and sea turtle strandings and mortality from vessel strikes and other causes does not publish or publicly report this data. Updates were made based on available information in Sections 3.12.3.2, 3.12.5.1.2, and 3.12.5.2.2.
Please provide justification and specific detail on how horizontal directional drilling underneath potential sea turtle nesting sites during cable installation would avoid impacts to sea turtle nesting areas.	Information that HDD is not anticipated to pass under nesting areas was added to Section 3.12.5.1.1.
Suction hopper dredging is being proposed for sand wave leveling and cable installation. Sea turtles are known to be vulnerable to impingement and entrainment in hopper dredges and injury and mortality has been documented. The DEIS mentions that “consultations with agencies in development of environmental protection measures such as	Protected Species Observers can reduce the potential for impingement or entrainment by spotting turtles surfacing within the shutdown zone. Suction hopper dredges move slowly, providing some opportunity to spot sea turtles as they surface to breathe. While this is not a fully protective measure, it does provide some opportunity to avoid injury or mortality when they are observed in the area.

NMFS Comment	Response
the use of PSOs are likely to reduce the risk of injury or mortality to sea turtles". Please provide details that support the use of PSOs in order to reduce the risk of sea turtle impingement or entrainment during hopper dredge activities. Given that sea turtles may be resting/foraging on the seafloor, PSOs may not be effective.	
Please include that increased surfacing time due to underwater noise would put sea turtles at greater risk for vessel strike.	This information was added to Section 3.12.5.1.2, along with details about the overlap between the shutdown zone and areas where sea turtles experience behavioral impacts and may spend more time at the surface and, therefore, be more vulnerable to vessel strikes.
Please provide additional details with respect to the pre-survey clearance monitoring measures that will be implemented prior to UXO detonation/blasting. Specifically, how will the MEC/UXO clearance zones be monitored for the presence for sea turtles prior to UXO detonations?	Updated information on the monitoring, avoidance, and mitigation strategies for sea turtles during MEC/UXO clearance activities was added to Section 3.12.5.1.2.2.
There is no consideration of a noise mitigation system in this section. Given that nighttime pile driving is proposed and the DEIS states that mitigation measures are not expected to reduce risk of exposure at night, it should be clarified that a noise mitigation system will be utilized (and how). And, the effects of nighttime pile driving on sea turtles should be considered given the lack of effective monitoring.	Modeling of the potential effects on sea turtles is based on a worst-case scenario, using the assumption that monitoring and mitigation strategies are not effective. Explanatory text has been added to clarify that exposure estimates are based on this approach and that daytime monitoring and mitigation are expected to lower the potential for effects from the modeled values, while nighttime pile driving will not effectively be able to reduce exposure through monitoring.
The DEIS mentions the use of several gear types such as gillnets during sampling efforts for fisheries monitoring surveys. The consideration of fishery monitoring surveys have the potential to catch and entangle/capture sea turtles. Please provide the specific gear types that will be used and the mitigation measures that will be implemented to reduce the likelihood for capture and entanglement of sea turtles during	Section 3.12.5.1.2 was updated to reflect the Fisheries and Benthic Monitoring Plan.

NMFS Comment	Response
fishery monitoring survey sampling.	
Gless et al. (2008) conducted a study on the response of juvenile leatherback turtles to light. They found that the subjects either 'failed to orient or oriented away from the lights.' This study only observes juvenile leatherbacks, not all species of marine turtle, and the results cannot be applied to all other marine turtle species. Loggerheads, for example, have been shown in previous studies to be attracted to lights produced from longline fishing vessels, as stated in the DEIS. Therefore, the conclusion 'there is no convincing evidence that marine turtles are attracted to vessel lights' cannot be drawn. Please revise.	The following language was added: "If sea turtles are attracted to the lights, it could increase the potential for interaction with equipment or associated Project impacts. However, due to the nature of Project activities and associated seafloor disturbance, turbidity, and noise, sea turtles are not likely to be attracted by lighting because they are disturbed by these other factors." This language is consistent with NMFS' analysis in both the Ocean Wind and Revolution Wind biological opinions.
This paragraph is in the operations and maintenance section, and begins with the claim that 'construction impacts to sea turtles could occur...' Please fix.	This was corrected in Section 3.12.5.2.2.
Clarify how the turbines proposed for use by Sunrise Wind relate to the turbines referenced in the sources in the Non-Impulsive WTG Operation section that are used to support the conclusion that operational noise impacts will be negligible. The turbines proposed for Sunrise are larger and will be installed on monopiles which differs from the smaller turbines (on jacket foundations) used for Block Island Wind Farm.	SRWF will use direct-drive turbines instead of gear-driven. Section 3.12.5.2.2 was updated with appropriate references and clarifying discussion based on the turbine type. However, even geared turbines would not be expected to reach the 175 dB rms behavioral threshold during normal operation.
Sea turtles do not forage on calanus. Thus, this analysis of the impacts to prey species is not accurate. Sea turtles do forage on other planktonic species such as jellyfish and salps. This section should be revised to be biologically accurate. Consider using some of the information presented in the finfish section.	Calanus was used as a proxy to estimate the potential impact on any given planktonic species for the potential proportional impact on prey species.

NMFS Comment	Response
The claim "This intake velocity estimate is below the threshold required for new facilities defined at 40 CFR §125.84(c) and is therefore protective against the impingement of juvenile and adult life stages of sea turtles. Therefore, it is anticipated that only egg and larval life stages of all species are at risk of entrainment." is misleading with regard to the life stages of sea turtles.	The reference to egg and larval stages was removed from the sea turtle section.
Please include that sea turtle eggs will be laid onshore and therefore not affected by seawater cooling. The eggs and larval stages would be to non-sea turtle species.	The reference to egg and larval stages was removed from Section 3.12.2.2.
The first sentence of the Traffic section states that "vessel traffic would be similar, but less than, those identified for O&M of the SRWF" - however this section is the O&M section. Please revise. Additionally there is no supporting reference to support the stated "negligible increase" in vessel traffic. Additional information should be provided regarding the frequency and severity of vessel strikes anticipated and which sea turtle species are expected to experience serious injury or mortality. This information is necessary to support the conclusion that there will be no population level effects.	This was corrected, and additional information was added in Section 3.12.2.2 on the proportional change in vessel traffic during O&M. The analysis was carried forward based on that information.
The following statement needs to be revised here and each time it occurs in the sea turtle section, as it makes an ESA determination that would only be made in a NMFS biological opinion: "we anticipate that the reasonably foreseeable offshore wind activities are likely to adversely affect but not jeopardize the continued existence of leatherback, loggerhead, Kemp's ridley, or green sea turtles." A preliminary determination may be made by an action agency in a biological assessment but the final determination is made by NMFS. NEPA impact definition terminology should be used	The language was revised to use NEPA impact terminology.

NMFS Comment	Response
instead.	
The conclusion in this section reads that population-level effects would not be expected for most species. There are only four species of sea turtle discussed in this section. Please include if any species is expected to have population-level effects, or change wording to clarify that population-level effects are not expected for any species.	The conclusion sections were corrected to state that population level impacts would not be expected for any sea turtle species.
Mitigation and monitoring measures are only briefly referenced with no analysis of their effectiveness. Additionally, measures that are mentioned are very sparse. Given the reliance on mitigation measures as part of the analysis, the lack of details regarding the actual measures, how they will be implemented, and their effectiveness is problematic and does not allow for a complete analysis. This should be addressed in the FEIS.	The factors considered most likely to have an impact on sea turtles include potential entrainment from dredging, underwater noise, vessel traffic, and gear utilization associated with trawl surveys. For all included analyses, we adopted a conservative approach to analyzing potential impacts, assuming minimal or no effectiveness to mitigation measures where the level of protective effect of those measures was uncertain. Dredging was considered to have some risk of entrainment for sea turtles with some unknown level of reduction from the use of Protected Species Observers (PSOs). Therefore, the impact analysis was based on dredging alone without a reduction in impact levels from using PSOs. Analysis for underwater noise impacts was completed assuming the worst-case scenario (e.g., mitigation is ineffective); therefore, mitigation measures were not key to making that impact level determination. The potential for vessel strikes was analyzed, including the APMs for voluntary speed reductions and vessel traffic levels for the area. Trawl survey methods were analyzed based on the proposed methods, and no additional mitigation measures were proposed.
In the first paragraph of § 3.6.7.1.5, the word "stations" is misspelled as "statins". In the first paragraph of § 3.6.7.1.5, would you please replace the misspelled word "statins" with its correct spelling "stations" in the following sentence: "NOAA-funded HF radar statins operated by NOAA Integrated Ocean Observing System (IOOS) academic partners exist within the region..."? [NOAA/NOS/IOOS]	The text has been revised in Section 3.20.1.5 (previously Section 3.6.7.1.5 in the Draft EIS) to correct the spelling to "stations."

NMFS Comment	Response
Please update the text to state that the "final", not "draft", report was released, see second sentence under Scientific Research and Surveys: "On December 5, 2022, NOAA Fisheries and BOEM published the final Federal Survey Mitigation Implementation Strategy for the Northeast U.S. Region.	The text has been revised in Section 3.20.9.1 to correct this.
There are many areas that speak to weather within the document, but nothing pertinent to the NEXRAD WSR-88D radar which is primarily used by National Weather Service Weather Forecast Offices during inclement weather to produce Watches, Warnings, and Forecasts for the protection of life and property. [NOAA/NWS/ROC]	Available information on the NEXRAD WSR-88D radar was reviewed, and pertinent material was included in the Final EIS. National Weather Service NEXRAD radar systems used in predicting and monitoring weather patterns will be impacted similarly to HF radars; however, NOAA states that impacts to NEXRAD radars are highest within a 3 km range and diminish as distance increases.
Please correct the last sentence by adding the word "met". The sentence should read "...which, after independent review, may be MET via adoption..."	The correction was made.
NMFS requests further clarification for the bounding of the Geographic Analysis Areas (GAAs). Please either provide an explanation in the text for the reason the GAA was restricted to capturing "the majority of the movement range for most species", or expand the GAA to include all movement of all species. NMFS has made this comment on multiple other project EISs, but this issue remains unresolved.	Where appropriate, the Draft EIS analysis did include adjacent leases. Section 1.6.1 explains how GAAs were applied, and resource-specific GAAs were defined at the beginning of each resource section in Chapter 3 of the EIS.
Please remove or revise the text at the top of page E-36 that reads: "BOEM developed the following tables based on its 2019 study National Environmental Policy Act Documentation for Impact-Producing Factors in the Offshore Wind Cumulative Impacts Scenario on the North Atlantic Outer Continental Shelf (BOEM 2019), which evaluates potential impacts associated with ongoing and future non-offshore wind activities. The content of these tables has been vetted by cooperating	The text was revised to eliminate reference to cooperating agency vetting of information.

NMFS Comment	Response
agencies to the EIS and therefore has been included in whole for their use in impact and cumulative analyses, and for ease in reference by the reader." This language suggests that the exact content of the tables that now appear in Appendix E were copied in their entirety from another document which had been vetted by the cooperating agencies at some point. NMFS, in its cooperating agency role, has not vetted the content of these tables. While NMFS has approved of tables that appeared in previous EISs and follow a similar approach and contain similar elements (i.e., South Fork Wind and Vineyard Wind), the content and variables of the tables in Appendix E are different than what appear in the tables of prior EISs.	
In the fourth paragraph, after the conclusion of the first sentence, please add the following sentence: "If a mitigation measure was analyzed in the impacts analysis for the selected alternative and that measure influenced the impact determination for a particular resource, that measure will be included as a term and condition." Any mitigation and monitoring terms that influence the impact conclusions need to be committed measures or proposed as part of the action in order for the assumptions and conclusions of the analysis to be accurate.	Appendix H has been revised to include this sentence.
Please ensure that all tables, figures, and graphs are 508 compliant before the EIS is made available to the public.	All EIS documents are made 508-compliant when released to the public.

O.4.1.2. U.S. Environmental Protection Agency

Table O-3. Responses to Comments from U.S. EPA [BOEM-2022-0071-0171]

EPA Comment	Response
Section 3.4.1 (pg. 3-8) of the DEIS indicates that the geographic analysis area covers the airshed within 15.5 miles of the onshore components and ports, the area within 3 nautical miles of state borders, the area within a 25-mile radius of the SRWF centroid and the offshore export cable centroid. For offshore analyses, it is unclear whether statute or nautical miles are being considered to support the geographic analysis area in Table D-1 Appendix D. Recommended Action: EPA understands that for offshore construction and operations emissions estimates, many developers are aligning their anticipated emissions between their Construction and Operations Plan and their Clean Air Act (CAA) Outer Continental Shelf (OCS) permit application, and within EPA's regulation at 40 CFR part 55, we interpret miles to be measured in nautical miles for the purpose of determining potential emissions from the source. EPA recommends that the FEIS clarify the metric used the in geographic analysis area for its offshore analysis and update Table D-1 Appendix D accordingly.	The metric used for defining the GAA was clarified in Section 3.4.1 and Appendix D, Table D-1.
Section 3.4.1.5.1.2 (pg. 3-19) of the DEIS indicates that offshore construction air emissions will be mitigated by using low sulfur diesel in generators on the WTGs or OCS-DC; low sulfur fuel, marine distillate, or marine residual fuels on vessels; engines that meet applicable air emissions standards to satisfy Best Available Control Technology and Lowest Achievable Emission Rate requirements; dust control; and obtaining emission reduction credits if required by the OCS permit. In past finalized offshore wind projects, e.g., Vineyard	Table H-3 of Appendix H has been updated to include these mitigation measures as appropriate. Please note that not all of these mitigation measures are within BOEM's statutory and regulatory authority but could be adopted and imposed by other governmental agencies.

EPA Comment	Response
Wind 1 and South Fork Wind, EPA has previously required more specific requirements on the use of Tier 4 engines located on the offshore substations and WTGs. Furthermore, EPA has required Tier 4 engines for project vessels operating as OCS sources with allowances for lower tiered engines if those vessels with associated engine are not available at the time of deployment. Recommended Action: EPA recommends that the FEIS acknowledge past determinations made by EPA on previously finalized permits for engines operating on offshore substations and WTGs and consider building in conditions that mimic past requirements for the use of Tier 4 engine standards. Additionally, EPA recommends acknowledging the vessel engine requirements EPA has required in past permits and consider adopting a similar structure into the FEIS. Furthermore, as an additional mitigation measure, BOEM should require Sunrise Wind to pursue the procurement of the most efficient and lowest emitting vessels available during the vessel contracting stage of the project. As part of this process, the FEIS should provide a discussion of the various options that are available to reduce these emissions. The FEIS should consider options for reducing emissions from ongoing operations and maintenance activity, such as the purchase of lower emitting or electrified crew vessels.	
Section 3.4.1.1 (pg. 3-9) of the DEIS indicates that there are no Class I areas within the geographic analysis area. The closest Class I area to the proposed Project Area is the Lye Brook Wilderness in Vermont. The Fire Island National Seashore is a Class II area meaning that some air pollution is permitted if the National Ambient Air Quality Standards and increment values, when applicable, are not exceeded.	BOEM added information from the Outer Continental Shelf (OCS) Air Permit Application and the air quality and visibility analyses into the Final EIS.

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Recommended Action: While no Class I area may be within the geographic analysis area BOEM is considering, EPA has required an air quality analysis and visibility analysis as part of the Sunrise Wind CAA OCS permit application. BOEM should consider adding the results of this analysis in the FEIS as additional information. The Sunrise Wind Class I analysis includes modeling results comparing the impacts of the proposed action to Class I significant impact levels of NAAQS pollutants and visibility using the CALPUFF modeling program. EPA also encourages BOEM to consider the application of long-range transport air quality modeling to evaluate impacts at Class I areas within a 300 km range of the project.	
Section 3.4.1.5.2.2 (pg. 3-22) of the DEIS indicates that the potential health benefits of avoided emissions were evaluated using USEPA's CO-Benefits Risk Assessment (COBRA) health impacts screening and mapping tool (USEPA 2022d). This tool estimates the health and economic benefits of clean energy policies. The COBRA web edition was used to analyze the health impacts of avoided emissions in New York, Connecticut, Rhode Island, and Massachusetts. However, in past EPA comments on BOEM EIS documents, EPA has recommended the use of Avoided Emissions and generation Tool (AVERT). The avoided emission estimates are provided in Table 3.4.1-4 (referenced as taken from the COP) but it appears to have been done using the COBRA program. Recommended Action: EPA continues to recommend the use of AVERT to evaluate emissions avoided.	Avoided emissions were estimated using BOEM's 2017 *Technical Documentation for the Offshore Wind Energy Facilities Emission Estimating Tool*. The text has been added for clarification.
Section 3.4.1.5.1.1 (pg. 3-16) of the DEIS states, "Sunrise Wind would implement environmental protection measures (APM AQ-01, AQ-02, AQ-03, AQ-04, AQ-05, AQ06, AQ-07, COP Section 4.3.4.3, Sunrise Wind 2022) to reduce or avoid air emissions during onshore construction	The duplicate paragraph was deleted.

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and installation activities. These measures include using engines and equipment that meet applicable air emissions standards (Tier 3, and if applicable, Tier 4); only using diesel generators during commissioning or emergencies; using low sulfur diesel fuel, marine distillate, or marine residual fuels; dust control; and using gas insulated switchgears to detect SF6 leaks. Onshore air emissions would be greatest during the construction phase and would be offset by the potential reduction in fossil fuel emissions. Air emissions would be intermittent throughout the 2-year construction phase and would have a minor to moderate impact on air quality." However, this paragraph is repeated in the next paragraph. Recommended Action: EPA recommends deleting the duplicate paragraph.	
Page 3-10 of the DEIS states, "For emission sources within state boundaries, within state territorial waters (3 nm [3.5mi; 5.6 km] of the shore) that are not included in the OCS air permit, and within a nonattainment area, BOEM must make a general conformity determination (40 CFR §93, Subpart B). It must be demonstrated that the action upholds the SIP, would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of any violation of a NAAQS, or delay timely attainment of a NAAQS or any required interim emission reduction or milestone. The general conformity determination excludes emissions accounted for in the OCS air permit. The general conformity determination includes emissions from construction and O&M of the onshore facilities and construction and O&M vessel transit through state waters outside of the 25- mi (40.2-km) OCS source centroid." Recommended Action: BOEM did not provide the draft general conformity determination along with supporting materials which	The activities for which BOEM has authority are outside of any nonattainment or maintenance area and, therefore, not subject to the requirement to show conformity. Discussions of, or comparisons to, general conformity emissions have been removed from the EIS.

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describe the analytical methods and conclusions relied upon in making the applicability analysis and draft conformity determination. Based upon the material provided, the following items need to be addressed: 1) Appendix K of the COP, which BOEM references as containing emissions calculations, is not publicly accessible. 2) It is unclear whether any marine vessel emissions that wouldn't be covered by an OCS permit are included in the applicability analysis. 3) For each non-attainment area, the applicability analysis should sum emissions from all counties in the non-attainment area for comparison to the general conformity de minimis threshold. Please contact Gary Rennie, EPA Region 1 at rennie.gary@epa.gov or Dan Birkett, EPA Region 2 at birkett.daniel@epa.gov for further assistance related to general conformity.	
Page 3-16 of the DEIS explains that NOx emissions in New York City and Port of Coeymans/Port of Albany exceed the general conformity de minimis thresholds during the two-year construction phase and asserts that they "would have a minor to moderate impact on air quality." Recommended Action: EPA recommends that BOEM explain the basis for this conclusion, which appears to contradict the definition of the "Moderate" impact level in Table 3.4.1-2: "Air emissions would be detected but would not exceed NAAQS or general conformity emissions. Air emissions could be minimized with PMEs."	The activities for which BOEM has authority are outside of any nonattainment or maintenance area and, therefore, not subject to the requirement to show conformity. Discussions of or comparisons to general conformity emissions have been removed from the EIS.

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In Table 3.4.1-3 (page 3-17), the general conformity thresholds for the New York Northern New Jersey-Long Island, NY-NJ-CT ozone nonattainment area (which includes Kings and Suffolk counties in New York) are listed as 50 tpy. The area was reclassified on November 7, 2022, as "severe." The applicable thresholds in severe nonattainment areas are 25 tons per year for NOx and VOCs. Recommended Action: EPA recommends correcting Table 3.4.1-3 to list the applicable thresholds of 25 tpy for NOx and VOCs for the New York-Northern New Jersey-Long Island, NY-NJ-CT ozone nonattainment area (which includes Kings and Suffolk counties in New York).	Table 3.4.1-3 was updated to reflect the reclassification of the New York-Northern New Jersey-Long Island, NY-NJ-CT ozone nonattainment area.
Section 3.5.6.5.2.2 of the DEIS (p. 3-300/PDF p. 422 and p. 3-345) discusses impacts to marine mammals in a section identified under "Accidental releases – cooling water." Recommended Action: This heading seems inappropriate because cooling water is continuously withdrawn and discharged (i.e.., not accidental). We recommend removing "Accidental releases" from the title of this section and rename it "Cooling Water" instead to clarify these are not accidental.	The IPF under Section 3.11.5.2 (Previously 3.5.6.5.2 in the Draft EIS) was retitled Operation of OCS-DC.
The DEIS (p. 3-52/PDF p. 174) states "Under the CWA, facilities that employ a cooling water intake structure with a design intake flow greater than 2 MGD and use at least 25 percent of the water withdrawn for cooling purposes are required to obtain an NPDES permit." Recommended Action: This statement is incorrect and should be revised to reflect that any discharge of pollutants from a point source to a water of the U.S. is required to obtain an NPDES permit. Sunrise Wind has submitted a complete NPDES application to EPA for	The text in Section 3.5.7.2.2 (previously Section 3.4.2.5.2.2 in the Draft EIS) was corrected.

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authorization of discharges to waters of the U.S. The use of a cooling water intake structure in this case means the facility is also subject to the requirements of Section 316(b) of the CWA and the applicability of Section 316(b) is not specifically tied to the size or amount of cooling water withdrawn.	
Table 3.1-1, page 3-4, under Discharges, indicates that there are onshore point sources. If so, NYSDEC would be responsible for permitting. Recommended Action: If this is the case, it should be reflected in the corresponding Description block and discussed in the EIS. Currently only EPA and USCG are mentioned within the Description block. Section 3.4.2.1.1 Onshore, describes that the onshore transmission cable (OTC) would cross the intercoastal waterway and Carmans River and what the water quality requirements are for these two water bodies. However, potential impacts on water quality appears to be from land disturbance and port utilization - not necessarily a point source discharge. If so, Table 3.1-1 should be corrected.	There are no known onshore point sources. The text in Table 3.1-1 was corrected.
The DEIS (Page 3-234) notes "[t]he NPDES permit included annual entrainment estimates of ichthyoplankton grouped within the egg and larval stages (Sunrise Wind 2022, Appendix N2). Since no distinction was made between the two life stages within the NPDES permit, entrainment numbers were considered larval estimates only when calculating adult equivalent losses to be conservative." Recommended Action: Considering a draft NPDES permit has not yet been released for public comment, the NPDES permit application should be referenced and provided.	Thank you for your comment. The draft National Pollutants Discharge Elimination System (NPDES) Permit is referenced in the Final EIS, and a reference has been added to this section as well.

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Page 3-346 indicates that "[t]here is potential that entrained individuals would survive passage through the CWIS due to short residence time in the system and a maximum water temperature exposure of only 90°F (32°C)" and refers to a 2000 EPRI study. However, during development of the 2014 CWA 316(b) Existing Facilities Rule, EPA determined that overall entrainment survival is extremely low and for purposes of national level estimates, entrainment leads to 100 percent mortality of entrainable organisms. In addition, the seawater passes through 500-micron filters, contact with which may introduce additional mortality for early life stages. Recommended Action: Lacking site specific/project specific information we recommend that BOEM not consider potential survival in the analysis of entrainment mortality.	BOEM did not consider potential survival in their analysis of entrainment mortality. This sentence was included to demonstrate that the entrainment estimate is conservative.
Design of the OCS-DC cooling system Recommended Action: The DEIS should explain whether alternative discharge port/diffuser designs were considered to optimize turbulent mixing of cooling water discharge.	Sunrise Wind initially considered several alternative outfall designs to contain the thermal plume, defined as a change of 2°F (1°C), per EPA's Quality Criteria for Water 1986 "Gold Book," within the regulatory mixing zone of 330 ft (100 m) from the point of discharge as defined at 40 CFR §125.121(c). The computational modeling using the Cornell Mixing Zone Expert System (CORMIX) was conducted under conservative, worst-case conditions. These worst-case assumptions were as follows: ambient temperatures were based on the spring season, which is when the ambient water temperature is lowest; flow conditions were based on a slack-tide scenario, which results in minimum turbulent mixing; and effluent flow was assumed to be the maximum flow of 8.1 million gallons per day (MGD); which is more than twice the 4.0 MGD average flow anticipated during the spring season. The modeled results under these conservative assumptions showed that the thermal plume will be contained within 87 ft (27 m) of the

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	discharge point with no migration to the surface waters or benthos. That is, the non-diffuser designs would result in rapid and complete mixing with no potential to cause unreasonable water quality degradation beyond the regulatory mixing zone. Sunrise Wind assessed a diffuser design early in Project development; however, such a design would increase the complexity of the outfall and the potential inspection, instrumentation, and maintenance requirements (on this uncrewed platform) to ensure the smaller ports of the diffuser remained clear of biofouling, and thus increase the risk of a potential shut down of the OSC-DC. Because the conservative, worst-case scenario of the thermal plume without a diffuser was well within the regulatory mixing zone limits, and an alternative design with a diffuser increases the complexity and risk without offering a corresponding environmental advantage, a diffuser design was not carried forward.
It appears that the most significant potential impacts on communities with environmental justice concerns in New York, New Jersey, Connecticut, Massachusetts and Rhode Island are related to the use of port facilities for berthing, staging, and loadout to support the construction and installation of offshore facilities. The DEIS states that potential EJ impacts at specific ports cannot be evaluated because BOEM is not certain which ports may be utilized for this project. Recommended Action: Localized EJ impacts at the ports being considered for usage should be fully identified in the FEIS for the selected alternative and affected communities, including port communities, should be given an appropriate opportunity to comment based on targeted outreach from BOEM. Additionally, port expansion and modifications to support the development of offshore wind infrastructure that may lead to increased port utilization constitute a	The ports to be utilized for construction and O&M activities have not been finalized. A list of possible ports to be utilized throughout the Project is presented in Table 3.17-5. The table includes the state in which the ports are located and any associated environmental justice communities. Environmental justice communities are also mapped in Figures 3.17-1 through 3.17-19. Port expansions and/or modifications are not considered part of the Proposed Action. The Final EIS identifies communities that the Project could disproportionately and adversely impact by identifying Census Block Groups adjacent to potentially utilized ports. These Census Block Groups are discussed in Section 3.17.1, and a comprehensive table of all 8,120 Census Block Groups in the GAA is provided in Appendix B. Outreach to communities around the Project Area was conducted through the NEPA process. Public scoping meetings and public

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reasonably foreseeable, indirect effect of the Proposed Action. Such impacts to communities with environmental justice concerns adjacent to such ports should be considered and disclosed.	hearings followed the release of the Draft EIS.
Air quality impacts associated with onshore activities and facilities are indicated to constitute a minor disproportionate impact on adjacent communities with environmental justice concerns. However, Section 3.4.1 (Air Quality) indicates that emissions from onshore activities and activities supported by ports in New York are estimated to exceed the de minimis thresholds. Recommended Action: BOEM should disclose the local air quality impacts, compare project emissions to the county inventory of emissions and rectify this potential discrepancy in classification of air quality impacts to communities with environmental justice concerns.	Thank you for your comment. County-level emissions data from the 2020 National Emissions Inventory has been added to Section 3.4.1 and compared to onshore emissions in Sections 3.4.5.1 and 3.4.5.2. While a few of the individual ports (i.e., Port of Albany, Port of Providence, Sparrows Point) may exceed de minimis thresholds, these emissions would be dispersed over time and would likely not cause nonattainment of air quality standards.
While the DEIS analyzes other ongoing and reasonably foreseeable future activities, as currently written, BOEM's EJ analysis does not consider these cumulative impacts in the determination of disproportionately high and adverse impacts. In accordance with the Promising Practices for EJ Methodologies in NEPA Reviews (Interagency Working Group on Environmental Justice, Promising Practices for Environmental Justice Methodologies in NEPA Reviews (p.39), March 2016.), "agencies may wish to consider factors that can amplify identified impacts (e.g., the unique exposure pathways, prior exposures, social determinants of health) to ensure a comprehensive review of potential disproportionately high and adverse impacts to minority populations and low-income populations." CEQ's guidance, Environmental Justice: Guidance Under the National Environmental Policy Act (1997) also encourages agencies to consider relevant public health and industry data concerning the potential for multiple or cumulative exposures to human health or environmental hazards in	The Final EIS has been updated to note populations adjacent to potentially utilized ports may have preexisting heath disparities. Although environmental justice communities were identified using EJSCREEN, the Center for Disease Control and Prevention's Environmental Justice Index (CDC EJI) was not utilized. The Final EIS acknowledges that certain environmental justice communities would experience a disproportionate adverse impact from elements of the Project, specifically around ports that would potentially be utilized by the Project.

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the affected population and historical patterns of exposure to environmental hazards, to the extent such information is reasonably available. . . even if certain effects are not within the control or subject to the discretion of the agency proposing the action". Recommended Action: BOEM should consider how relevant existing conditions in communities with EJ concerns across cumulative environmental, health, socioeconomic and climate stressors may ultimately lead to impacts that are disproportionately high and adverse. Please refer to a number of tools such as the Environmental Justice Screening and Mapping Tool (EJ Screen) and the Center for Disease Control and Prevention's Environmental Justice Index to obtain information on pre-existing pollutant and health burdens that may inform the cumulative impacts analysis.	
Communities with EJ concerns are often disproportionately burdened by environmental hazards and stressors, unhealthy land uses, psychosocial stressors, and historical traumas, all of which drive environmental health disparities. Recommended Action: The FEIS should consider whether communities impacted by this project may already be experiencing existing pollution and social/health burdens. Additionally, the FEIS should further describe the health effects of impacts. BOEM should consult with potentially impacted communities and community organizations to develop a comprehensive stakeholder outreach/EJ public engagement plan for areas that may be impacted by the proposed action and provide an opportunity for affected communities to inform the project's mitigation measures. This outreach plan should detail information on planned engagement	The Final EIS has been updated to note that populations adjacent to the existing ports that may be utilized for construction or O&M phases may have preexisting health disparities. The Final EIS acknowledges that certain environmental justice communities would experience a disproportionate adverse impact from elements of the Project. Outreach to communities around the Project Area was conducted through the NEPA process. Public scoping meetings and public hearings following the release of the Draft EIS. Where State guidance indicated, linguistically isolated populations were included in the environmental justice identification process (e.g., New Jersey). Additionally, text has been added to the Final EIS to ensure Project-related information should be translated for linguistically isolated populations. BOEM is evaluating best management practices and strategies to address these concerns.

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milestones and commitments to meetings with potentially impacted communities and community organizations. We encourage BOEM to develop communications written in plain language that can be understood by all affected community members. EPA has documented recommended approaches to engaging with communities with environmental justice concerns in the NEPA process in the report, Promising Practices for EJ Methodologies in NEPA Reviews, as well as additional resources to inform engagement with potentially impacted communities on EPA's EJ and NEPA website, located at https://www.epa.gov/environmentaljustice/environmental-justice-and-national-environmentalpolicy-act. BOEM should determine if linguistically isolated populations reside in the geographic areas impacted by the proposed project and should provide appropriate translation and interpretation services to ensure meaningful engagement. All outreach efforts should be documented in the EJ section of the DEIS. Often the best way to assess translation and interpretation needs is to connect with people who live in impacted communities, including local government officials and community-based non-governmental organizations. Public meetings should be accessible to all and scheduled at times that accommodate the greatest number of participants.	
The DEIS discussion regarding the consideration and ultimate dismissal of the use of 14 MW WTGs for the project (DEIS page 2-40) concludes that, "[b]ecause this alternative is not operationally, technically, and economically feasible and implementable, it was eliminated from further consideration." The information provided does not fully explain why this size WTG is operationally infeasible. Recommended Action: Based on the brief analysis provided it appears	Thank you for your comment. A 14-MW wind turbine generator (WTG) is larger than what is proposed in the Project's design envelope defined in the Construction & Operations Plan (COP) and evaluated in the EIS. Consideration of a larger capacity WTG would require an update to the COP, additional National Environmental Policy Act (NEPA) review, and reinitiation of the NEPA process. Thus, the impact of requiring larger capacity WTGs would effectively equate to the selection of Alternative A - No Action Alternative.

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that decisions to eliminate consideration of the 14 MW WTG are largely related to the potential for delays caused by such a change. These schedule changes could result in negative consequences (affecting economic feasibility). It remains unclear from the discussion (because the information is identified in the discussion as business confidential) why a 14 MW WTG is technically or operationally infeasible. We recommend that the discussion be expanded to more fully explain this portion of the dismissal rationale. It would also be helpful to have more detailed information to explain the timeframe associated with the NYISO review of a modification request "…to redo the System Reliability Impact Studies and Class Year Facilities Studies."	
Burial of the transmission cable, particularly if the jetting method is employed, has the potential to suspend significant quantities of sediment. There is a specified requirement for a water quality monitoring plan (WQ-04, Appendix H, page H-6 or pdf 8), but no specified criteria other than "minimize impacts to sensitive habitats…" (WQ-01, page H6, pdf 8) or "…to the extent practicable" (GEN-08, page H-3, pdf 6). Recommended Action: We recommend that BOEM consider setting the monitoring limits/triggers for the proposed construction to reduce suspended solids as part of the construction plan development. EPA would appreciate the opportunity to review any standards that are developed as part of that effort.	Sunrise Wind has developed an Environmental Management and Construction Plan, which includes a Suspended Sediment and Water Quality Monitoring Plan (SSWQMP) in accordance with the Certificate of Environmental Compatibility and Public Need Conditions 182-189, 193. The SSWQMP includes plans for monitoring during construction, maintenance, and decommissioning activities that disturb sediments associated with the SRWEC-NYS corridor out 3 nautical miles (nm; 1.2 mi; 1.9 km) to the New York State Waters boundary. The plan specifies limits for total suspended solids and specific conditions depending on the excavation method used (e.g., jet trenching, hand trenching, sand wave leveling).
The DEIS provides general information to explain that portions of the export cable will require armoring to prevent cable damage where burial depths cannot be met due to substrate conditions or where other cables must be crossed.	As noted in the EIS, there are no exclusion zones, and fishermen will have charts of the locations of the cable emplacement and armoring. Section 3.14.5 indicates, "Cable, WTG, and OCS-DC locations would be indicated on nautical charts, helping to reduce the potential for

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Recommended Action: We recommend that the discussion of cable armoring impacts be expanded to address the potential for fishing gear damage and whether mitigation for the armoring would be appropriate. We also recommend that the discussion address whether exclusion zones will need to be established to prevent damage to fishing gear. Because the information contained in the cable burial feasibility assessment was provided under confidential cover in Appendix G4 it is difficult to understand impacts associated with this element of the project. As this information speaks directly to project impacts, we recommend that the information be made accessible.	fishing gear interactions." Additionally, BOEM is proposing Sunrise Wind provide a scour protection plan.
2.1.2.2.6 Unexploded ordnances/munitions and explosives of concern (UXO/MEC) (p. 2-27). The DEIS identifies the possible presence of UXOs along the construction route and the potential need to move or detonate them. The DEIS correctly identifies UXOs as a potential threat to the health and safety of project participants. An explosion from an UXO could also adversely affect marine life. Recommended Action: EPA recommends that the FEIS identify this potential impact to whales and other marine life in the area and describe how Sunrise Wind will coordinate with NMFS and take the necessary precautionary steps when handling or detonating UXOs is anticipated. We also recommend that the FEIS more fully explain whether acoustic modeling or other analysis of potential acoustic/pressure effects on marine organisms, including but not limited to marine mammals was conducted for UXO/MEC detonation.	The potential for impacts to fish, turtles, and marine mammals from UXO/MEC clearance activities have been modeled and were discussed in the Draft EIS. The Final EIS includes updated exposure estimates and required avoidance and mitigation strategies.
Page: 404 Section 3.5.6.5.1.2.2 Impulsive Sound - MEC/UXO Clearance Activities Recommended Action: We recommend that the FEIS specifically	The Final EIS includes updated information on monitoring, avoidance, and mitigation strategies. Additional text describing some potential noise mitigation strategies to achieve the required 10 dB of broadband attenuation was added. However, the selection of sound

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describe what type of noise attenuation will be utilized.	mitigation technologies has not been finalized and may depend on site-specific criteria.
The DEIS states at 3.5.2.1.4 - ICW-HDD (p. 3-82), "SAV beds including some eelgrass (Zostera marina) were found off the south shore of the channel." But at 3.5.2.1.8 - Sensitive Taxa and Species of Concern (p.3-86) the DEIS states, "The benthic surveys did not identify any sensitive taxa, species of special concern, or nonnative taxa at any of the stations along the SWEC-NYS or the ICW-HDD; however, within the estuarine environment of the ICW HDD, the presence of seagrass beds, such as those observed along the south shore of the channel, are considered sensitive and ecologically important benthic habitat." Without a graphic or more detailed description, it's unclear where the eelgrass bed is in relation to the ICW HDD area. Recommended Action: EPA recommends the location of the eelgrass bed be better described or illustrated in the FEIS in relation to the proposed project.	The Final EIS characterized the eelgrass as potentially occurring in the Project Area and noted that it was found in 2018 but has not been confirmed in a more recent survey (2022). Sunrise Wind has described pre-Project surveys for the area that would confirm or deny its presence prior to surface disturbance.
EPA is concerned that the DEIS generalizes project impacts with broad, general metrics to compare impacts across alternatives (negligible, minor, moderate or major impacts). The broad metrics often result in differing alternatives being characterized as having similar impacts when they are not. Recommended Action: The NEPA analysis would benefit from less focus on the presentation of generalized impacts and more on the clear tradeoffs between alternatives as measured by impacts. Such an approach would provide greater emphasis on the design of Fisheries Habitat Impact Minimization Alternatives C-1 and C-2 that are intended to result in lowered impacts to benthic, finfish and EFH habitats, according to the DEIS at NMFS direction. Both alternatives	Sections 1.5 and 1.6 of the Final EIS provide an explanation of the impact analysis approach. Additional clarification was added to Table 2.4-1 and Table ES-2 to distinguish between the impacts of each action alternative alone and cumulative impacts, consistent with Chapter 3 template changes. Resource-specific impact level definitions are presented in each resource section, and the impacts of each alternative align with the appropriate impact level, as supported by the analysis. Alternatives reduced impacts on many resources; however, they did not always result in a change to the resource's impact level conclusion. The minimization of impacts is identified and quantified where possible in the Final EIS. For the No Action Alternative analysis in the Chapter 3 resource

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will reduce the number of WTGs and relocate project components (WTGs and their associated inter-array cables, scour protection and other project infrastructure) away from areas containing important complex bottom habitat. According to the DEIS, reducing the number of WTGs and associated cable and other infrastructure for Alternatives C-1 and C-2 in comparison to Alternatives B reduces the acres of long-term disturbance to complex bottom habitat by 22% to 50%, respectively. These impacts are not similar and highlight importance of a focus on specific project impacts in the analysis. As Alternatives C-1 and C-2 appear to meaningfully reduce project impacts we recommend that BOEM continue to work to expand upon the discussion of the differences in impact across alternatives rather than focus on categorizing the impacts with broad metrics. We also encourage BOEM to fully explain the decision-making rationale should a more damaging alternative ultimately be selected. These changes will benefit both the NEPA process and BOEM decision-making regarding alternatives. Lastly, we note that while consideration of future foreseeable development in the region is appropriate for assessment of cumulative impacts it remains inappropriate for direct comparisons between specific project alternatives.	sections, the Final EIS was updated to present the analysis of the ongoing non-offshore wind and ongoing offshore wind activities under a separate subheading from the planned non-offshore wind and offshore wind activities. The Proposed Action and action alternatives were also updated to present the cumulative impact analysis under a separate subheading. Under Section 3.7.9, Table 3.7-9, a comparison of habitat impacts for each alternative is presented for temporary and permanent impacts based on habitat type.
Section 1.6 Methodology for Assessing Impacts (p 1-13). The method used by BOEM in this DEIS and others for comparing alternative impacts using established “geographic analysis areas” (GAA) can, in many cases, limit opportunities for meaningful impact comparisons when the areas analyzed are grossly disproportionate to the project area. This can undermine the ability for the public to accurately compare anticipated project specific impacts of the various alternatives under consideration and often results in impacts	Comment noted. The GAAs presented in the Draft EIS are based on the geographical distribution of organisms that could be affected by Proposed Action and the cumulative effects of the other proposed offshore wind projects on the Mid-Atlantic Outer Continental Shelf. BOEM has reviewed the discussions of GAAs within the Final EIS and deemed them appropriate for analysis.

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associated with the No Action Alternative being equal, or greater than, the Proposed Alternative. For example, the DEIS states that "Under the No Action Alternative, several thousand miles of cable would be added in the EFH, finfish, and invertebrate GAA, as well as within the benthic GAA, producing EMFs in the immediate vicinity of each cable during operations." (p. 3-92). The project lease site is 86,769 acres and the cable corridor is 106 miles long by approximately 200 meters wide while the GAA that is being used to compare these impacts encompasses thousands of square miles within the Scotian Shelf, Northeast Shelf, and Southeast Shelf Large Marine Ecosystems (Appendix D). We recognize that there is site-specific impact information provided in Section 3 of the DEIS, however, even these comparisons are made to the subject GAA, and the reviewer is left to believe that impacts from not permitting this project to proceed would be greater than if it were, which seems implausible. Recommended Action: While we realize this is the approach being used for this DEIS, EPA recommends that for future projects BOEM develop more representative GAAs for making these alternative impact comparisons. This would allow the public to make a more informed and realistic assessment of impacts associated with the range of alternatives.	
Under Impacts of Alternative A – No Action on Benthic Resources (3.5.2.3), the DEIS states, "Under the No Action Alternative, several thousand miles of cable would be added in the EFH, finfish, and invertebrate GAA, as well as within the benthic GAA, producing EMFs in the immediate vicinity of each cable during operations." (p 3-92). Given that this is an analysis on "benthic resources" only, not EFH, finfish, and invertebrates, which is covered separately, describing the magnitude of impacts associated with the GAA for EFH, finfish, and	The impact evaluation area was revised to just the Lease Area and buffered cable alignments. Clarification was also added on the purpose of the GAA to inform the general characterization of benthic habitats in the wider area. The text in Section 3.7 was revised to say, "For the assessment of future offshore activities, the analysis area was expanded to include an approximately 10-mile (16-km) buffer for characterization of the surrounding habitat, and prior and ongoing studies of Southern New England region were reviewed to

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invertebrate does not seem appropriate as it exaggerates the potential impacts associated with that GAA versus the much smaller “Benthic Resource” GAA. Recommended Action: EPA recommends the comparisons of impacts in this section be limited to the Benthic Resource GAA. We note however that the Benthic Resource GAA inflates the area of the actual lease site with a 10-mile buffer around the site, more than doubling the lease site area.	describe the benthic environment. More specific analysis is supported by the site-specific surveys conducted within the SRWF Lease Area."
EPA received the February 8, 2023 memorandum from NMFS to BOEM regarding “Additional Information Necessary to Initiate ESA Section 7 Consultation for the Sunrise Wind Project” and acknowledges that NMFS has identified a number of deficiencies in the Biological Assessment for the project that must be addressed. As EPA must complete Section 7 Consultation for both the air and NPDES permits for this project, we are invested in the outcome of this consultation. Recommended Action: EPA requests that BOEM identify how and when it will provide the additional information and clarifications requested by NMFS to initiate consultation. In particular, NMFS requested specific information about the NPDES permit application and more complete information on the anticipated impacts of the thermal plume and other pollutants. EPA is willing to cooperate with BOEM to ensure that the biological assessment is complete and fully evaluates the potential impacts of the offshore converter station on endangered species and critical habitat.	Updates are provided in the updated Biological Assessment.
The DEIS details numerous areas where additional work is either necessary or underway to evaluate and understand potential impacts of project construction and operation. Some of the areas highlighted in the DEIS where impacts remain under assessment (and studies are underway) include but are not limited to: the evaluation of EMF	As studies have been conducted, the Final EIS has been updated. Additional surveys may be conducted as part of permit conditions. See Section H.4 in Appendix H for permit conditions.

EPA Comment	Response
effects (p. 3-92), benthic impacts (through monitoring) (p. 3-94), impacts to epifaunal communities (p. 3-111), ongoing research on Cox's Ledge to understand the distribution and habitat use of spawning cod (acoustic telemetry study), cold pool dynamics (p. 3-231), and a seasonal trawl survey by UMASS for project goal of 2 years of pre-construction monitoring (p. 3- 236). Recommended Action: We recognize and support the ongoing investigations/studies identified in the DEIS as they are directly related to developing an understanding of impacts caused by the proposed project. We recommend that the FEIS specifically detail when outstanding impact analysis work will be complete and how the results of the analysis will be integrated into BOEM decision-making for the Sunrise project. Responsible parties should also be identified. New information regarding impacts should be made public to the degree possible as part of the NEPA process for the project.	
3.5.2.3.2 Cumulative Impacts of the No Action Alternative (p. 3-90). The DEIS identifies potential impacts to the "Mid-Atlantic Bight cold pool" from wind turbine structures as an issue of emerging interest and ongoing research. However, there is no discussion of how this issue pertains to wind turbines sited in this general area. Such a discussion is provided in the DEIS at 3.4.2.5.2.2, Offshore Activities and Facilities (p. 3-53), which states, "The presence of structures is known to alter the vertical and horizontal mixing patterns of ocean waters which could influence water quality (e.g., water temperature, salinity, DO, turbidity) by changing the thermal stratification and mixing between surface and deep waters (e.g., Carpenter et al. 2016; Cazenave et al. 2016). Results from a recent BOEM (2021) hydrodynamic model of four different WTG build-out scenarios of the offshore MA/RI Lease Area found that offshore wind projects have the	Information on the cold pool was added under Sections 3.7.3.2 and 3.10.5.2.2 in a discussion about the presence of structures.

EPA Comment	Response
potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification), via their influence on currents from WTG foundations and by extracting energy from the wind." Recommended Action: EPA recommends that the FEIS provide more information on the potential effects of wind turbines on the "cold pool" in this section as was presented in 3.4.2.5.2.2 and provide a research plan to address how the presence of wind turbines may alter the Mid-Atlantic Bight cold pool.	
The DEIS states at 3.5.2.1.7 SRWF Lease Area (p. 3-86), that "BOEM is currently funding a 3-year study (AT-19-08) examining movement patterns of Atlantic cod, black sea bass (*Centropristis striata*), and other species in the southern New England region, including the SRWF Lease Area. The study is being conducted by NMFS and a team comprising a state resource agency, a university, and a nonprofit organization (BOEM 15 2019). Given the level of concern raised about potential impacts on Cox Ledge and Atlantic cod, the discussion of potential effects presented in the following sections places emphasis on this and other species of particular concern." Recommended Action: EPA supports BOEM funding this study and hopes that the results can inform this project and other wind projects. The DEIS at 3.5.5.1 (p. 3-196) also mentions this study and states that, "Peer-reviewed literature and reporting on this research would be considered in the Sunrise Wind Final EIS if available." We urge BOEM to present any findings in the FEIS that result from this study, even if they have not yet been peer-reviewed.	Available results were included in the Final EIS.
The DEIS at 3-243 (PDF page 365) notes, "[f]or Alternative C-2, this analysis was expanded upon to relocate 12 WTG positions from the Priority Areas to the eastern side of the lease area in addition to	Results of surveys on the eastern side were not available when the Draft EIS was published; a new alternative was developed, and results from the eastern surveys were included in the Final EIS.

EPA Comment	Response
excluding development of the 8 WTG positions identified in Alternative C-1. This alternative assumes that habitat on the eastern side of the lease area is more suitable, but this assumption may change depending on the results of additional surveys conducted in this area during the summer of 2022." Recommended Action: It is unclear why the summer 2022 survey results were not incorporated into the DEIS analysis. Regardless we encourage BOEM to include the survey results in the FEIS to the degree that they provide information that helps to inform the understanding of the impacts of the alternatives.	
The FEIS would benefit from a more robust consideration of climate change risks to the proposed action in the description of the affected environment. Recommended Action: We recommend that the discussion be expanded to include consideration of climate resiliency measures, particularly for infrastructure that may be vulnerable to the impacts associated with climate change (such as sea level rise, more frequent storms, etc.). This discussion would provide additional details regarding the durability of the proposed infrastructure (including WTGs and buried cables at all locations) in the face of more severe weather and more severe sea states.	Climate change has been added as an IPF for relevant resource areas. The OnCS-DC would be located well inland, above the 100-year and 500-year floodplain. The minimum equipment elevations at the OnCS-DC site exceed both the present-day and future worst-case Design Flood Elevation, as recommended by the American Society of Civil Engineers. The design also considers the potential effects of erosion, high winds, and ice. Additional information on meteorological conditions was added to Appendix B.
Recommended Action: We recommend that the FEIS provide detailed information on how frequently and at what scale cable maintenance/repair/replacement will occur, as well as the level of impacts associated with cable maintenance/repair/replacement.	The SRWEC and IAC would typically have no maintenance requirements unless a fault or failure was to occur. To evaluate the integrity of the assets, Sunrise Wind intends to conduct a bathymetry survey along the entirety of the cable routes immediately following installation (scope of installation contractor) 1 year after commissioning, 2–3 years after commissioning, and 5–8 years after commissioning. Based on the outcome of these

EPA Comment	Response
	assessments, several options may be undertaken, as feasible, permitted, and practical, such as remedial burial, addition of secondary protection (rock protection, rock bags or mattresses), and increased frequency of bathymetric surveys to assess reburial. Section 2.1.2.2.2.1 of the EIS discusses Sunrise Wind's expectations for cable maintenance.
EPA appreciates the discussion of potential impacts to the Long Island Sole Source Aquifer and acknowledges best management practices to reduce potential impacts to surface, coastal, or ground water quality. Recommended Action: EPA supports the trenchless installation methods to avoid or minimize impacts to water quality. We further recommend efforts be made to minimize impacts to sensitive environmental resources such as complex benthic habitat, submerged aquatic vegetation and wetlands. This includes careful consideration of timing of surveys conducted prior to construction to avoid and reduce impacts to these resources. EPA also recommends that the DEIS indicate how the Project might affect current efforts to preserve the quality of water resources (for example as outlined by the Carmans River Conservation and Management Plan). We also recommend that the DEIS include a summary table that clearly demonstrates acreage of sensitive habitat impacted by each alternative to facilitate a meaningful comparison.	Efforts to protect water resources and sensitive habitats were added to the Final EIS, and the acreage of sensitive habitat for applicable resources will be included. Additional discussion related to the Carmans River has been added to Section 3.5.6.1. Areas of complex habitat have been prioritized and were used in the siting of the WTGs in Alternative C. Efforts will be made to reduce the number of boulders that would require relocating, and relocation methods will strive to minimally disturb boulders and relocate them as close to the original location as possible. Several tables with comparative numbers for habitat types are in Section 3.7, *Benthic Resources*. Concerning wetlands, Coastal Habitats Table 3.9-4 (discussed in Section 3.9.4) indicates acres of impacts to each designated area, which does not change under the alternatives, except for the No Action Alternative, as described in the text. Surveys for sandplain gerardia and seabeach amaranth are addressed in the Biological Assessment, including "Time-of-year restrictions for certain work activities (e.g., HDD conduit stringing) will be applied to the extent practicable to avoid or minimize direct impacts to sandplain gerardia, seabeach amaranth, and their habitat during construction of the landfall and onshore facilities. If work is anticipated to occur outside these time-of-year restriction periods, coordination with state and federal agencies will be accomplished to develop construction monitoring and impact minimization or mitigation plans, as appropriate." The Final EIS was revised based on the final

EPA Comment	Response
	Biological Assessment/Biological Opinions. Surveys for birds, bats, and other wildlife are addressed in each corresponding chapter, as well as the Biological Assessment.
Based on our review more could be done to improve access supporting information referenced in the analysis. Throughout the reader is directed to supporting information presented in separate documents but these references are generally provided with no active direct link to the cited reference. Recommended Action: While we understand the need to reference supporting information to meet established page limits, we recommend that BOEM could take steps to better bridge access to information referenced in the main body of the EIS and supporting documents such as the COP or Appendices to the EIS. We continue to recommend the use of hyperlinks directly to the information being referenced. Ideally references would be hyperlinked, so that a reviewer can click on the referenced information link (e.g., a COP table) and be taken directly to that table in a DEIS appendix. In the absence of a hyperlink, we appreciate the instances where specific source document information including page number, etc. is provided in the body of the EIS.	Thank you for your comment. We have made a good-faith effort to provide sources of information throughout the EIS. Sections, tables, and figures of the COP are referenced in the text when applicable. Tables and figures within the EIS are linked for the reader's ease.
Table 3.4.1-5. "Comparison of Alternative Impacts on Water Quality" (p. 3-29) pertains to air quality Recommended Action: Correct the table title.	The title of Table 3.4-10 was corrected (previously Table 3.4.1-5 in the Draft EIS)
The DEIS repeats the same information below on pages 3-689 and 3-690: "The proposed Project's Onshore Facilities would be located in Suffolk County, which has many summer tourism destinations and approximately 980 mi (1577 km) of coastline, including Montauk, the Hamptons, and Fire Island (Bolger 2016). Southampton is a popular	Section 3.21.1 has been revised to remove the redundant paragraph.

EPA Comment	Response
recreation and tourism destination that has two of America's ten top-rated golf courses, shops and attractions, and white sand beaches (ICF 2012). The Fire Island National Seashore encompasses 19,579 acres (7,923 hectares) of protected land that features high dunes, forestland, undeveloped sandy beaches, and abundant wildlife that attracts large numbers of visitors, including surfers, nature enthusiasts, campers, boaters, and beachgoers (ICF 2012; Bolger 2016). This area also houses the Fire Island Lighthouse, 17 listed on the National Register of Historic Places, a culturally and historically significant monument (NPS 2018)." Recommended Action: The last sentence of the redundant paragraph on page 3-690 ("In 2017, 681,518 people visited National Park Service sites on the Fire Island National Seashore.") could simply be retained in the text of the previous paragraph.	
Section 2.1.2.3 Operations and Maintenance only has one sub-section, 2.1.2.3.1 Onshore Activities and Facilities. Recommended Action: Please consider whether operations and maintenance are relevant to offshore activities and facilities as well. It seems that Section 2.1.2.4 Offshore Activities and Facilities, should be reassigned as 2.1.2.3.2. and the numbering for the subsections adjusted as well.	The formatting inconsistencies were updated.
Page: 55 2.1 Alternatives Analyzed in Detail "Alternatives considered but dismissed from detailed analysis and the rationale for their dismissal are described in Table 2.1-1." Recommended Action: Dismissed alternatives do not appear to be described in Table 2.1-1 as indicated. This should read Table 2.2-1.	The table number has been updated appropriately.

EPA Comment	Response
On Table 2.4.1 (page 2-49, pdf page 102) under the Benthic Resources section, Alternative C-2 has the exact same description as Alternative C-1. Recommended Action: We recommend that the tables be reviewed for accuracy and question whether the Alternative C-2 description should also mention that an additional 12 WTG positions would be removed from the Priority Areas and relocated to the eastern side of the lease area.	Thank you for your comment. Table 2.4-1 has been revised to indicate the correct number of WTGs.

O.4.1.3. United States Coast Guard

Table O-4. Responses to Comments from USCG [BOEM-2022-0071-0167]

USCG Comment	Response
The DEIS adequately evaluates the impacts to Navigation and Vessel Traffic and USCG missions, which resulted in an assessment of minor to moderate adverse impacts. The USCG does not oppose Alternatives B, C-1, and C-2, noting the Project would maintain a uniform east-west and north-south grid pattern of I x I nautical mile spacing between turbines in each alternative. It is especially imperative Alternatives C-1 and C-2 maintain a clear grid pattern of uniform lines of orientation as these alternatives call for the potential exclusion of eight to twelve turbines, which may lead to reduced uniformity and increased risk to vessel navigation. As concluded in the USCG's Massachusetts/Rhode Island (MA/RI) Port Access Route Study, a key means to mitigate impacts to Navigation and Vessel Traffic and USCG missions is for each wind farm across the entire MA/RI wind energy area to be organized in straight rows and columns, creating a grid pattern consisting of at least three lines of orientation. Common turbine spacing and layout help facilitate navigation safety, consistent and continuous marking and lighting, search and rescue, and other uses, such as commercial and recreational fishing.	Thank you for your comment. The 1-by-1 nautical mile grid spacing was considered in the alternative analysis, and we have incorporated your comments into Sections 3.19.6.1.2, 3.19.6.2.2, 3.19.7.1.2, and 3.19.7.2.2.
The USCG recommends all Applicant-Proposed Measures (Table H-1) and Potential Mitigation and Monitoring Measures (Table H-2) of Appendix H: Mitigation and Monitoring, be made mandatory with the following exceptions: a) The USCG does not concur with the entire description of Other Agency-Proposed Mitigation Measure No. 5, Safety Zone During Cable Installation on page H-67 of Appendix H: Mitigation and Monitoring. The USCG supports all elements of the mitigation measure description	Thank you for your comment. a) APM No. 5, Safety Zone During Cable Installation, has been removed from the Final EIS and Appendix H. b) All references to NVIC 01-19 are correct. c) USCG was added as an enforcing agency to the APM, stating "No permanent exclusion zones during operation of the SRWF, so both Project and non-Project vessels will be free to navigate within, or close to, the SRWF." Previously, this was labeled as GEN-18, and it is

USCG Comment	Response
except "establishing a safety zone around the cable laying vessel(s)". The USCG does not intend to establish safety zones around cable laying installation vessels and the authority should not be used as a measure to mitigate potential impacts from cable installation operations. b) The USCG requests all references to Navigation and Vessel Inspection Circular (NVIC) 02-07 be replaced with the most recent version; NVIC 01-19. c) The USCG requests the Anticipated Enforcement Agency listed for Applicant-Proposed Measure GEN-18 on page H-4 of Appendix H: Mitigation and Monitoring, include the USCG as the agency with statutory authority for establishing exclusionary areas and safety zones on the Outer Continental Shelf.	now labeled as GEN-25.
Additionally, the USCG recommends the following: a) Safety Zones: The Commander, Coast Guard First District may consider the establishment of safety zones in the Project area on a case-by-case basis. Safety zones will not be granted for the sole purpose of keeping project construction on schedule and the authority should not be used as a mitigation measure when considering potential risks and impacts.	Comment noted. This will not be used as a mitigation measure.
Additionally, the USCG recommends the following: b) Post Record of Decision Involvement: The USCG requests timely access to construction plans, such as Facility Design Reports and/or Fabrication Installation Reports for the purpose of identifying activities impacting Navigation and Vessel Traffic and USCG missions on the Marine Transportation System, especially Cable Burial Plans and their associated risk and feasibility assessments. Early access to these documents may prevent conflicts with planned activities.	Thank you for your comment. Language has been inserted into Section 3.19.5.1.2 of the Final EIS.

USCG Comment	Response
Additionally, the USCG recommends the following: c) Amending Mitigations: The USCG requests the opportunity to suggest amendments to approved mitigations and terms and conditions at any time before, during, or after installation of the wind farm should material facts or circumstances come to light that were either unforeseen or were not reasonably available at the time these conditions were issued.	The USCG can review mitigations and terms and conditions during the review of the EIS in all stages and will have the opportunity to review the terms and conditions before any approvals.
Additionally, the USCG recommends the following: d) Re-Evaluation: The USCG requests the opportunity to re-evaluate any future mitigation analyses required by the Department of Interior, especially related to Navigation and Vessel Traffic, USCG missions, and Other Uses, such as National Security and Military Activities, Aviation and Air Traffic, and Radar Systems.	The USCG can review mitigations and terms and conditions during the review of the EIS in all stages and will have the opportunity to review the terms and conditions before any approvals.

O.4.1.4. National Parks Service

Table O-5. Responses to Comments from National Parks Service [BOEM-2022-0071-0255]

NPS Comment	Response
For the project to proceed as proposed, the NPS must issue special park use permits to authorize the construction of the conduit and power cable in FIIS waters and lands under waters, and the transit of the project materials and equipment barge through the intercoastal waterway water column under NPS jurisdiction. The NPS must also issue a ten-year renewable right-of-way (ROW) permit for the power cable conduit.	Thank you for your comment. We have revised the Final EIS with language provided by the National Parks Service (NPS) to clarify what permits are necessary. This language can be found in the *Executive Summary*, Section 1.2, *Purpose and Need*, Section 2.1, *Alternatives*, and Appendix A, *Required Environmental Permits and Consultations*.
The NPS has from the beginning of this project made clear that we intend to rely on BOEM's environmental impact statement (EIS) and record of decision (ROD) for our decision on whether to issue the special use permits and ROW permit described above. We have also from the beginning raised our concerns about the information that would need to be analyzed and disclosed in the EIS. However, this DEIS lacks certain necessary information.	Thank you for your comment. We have revised the Final EIS with language provided by the NPS to clarify what permits are necessary. This language can be found in the *Executive Summary*, Section 1.2, *Purpose and Need*, Section 2.1, *Alternatives*, and Appendix A, *Required Environmental Permits and Consultations*.
Overall, the NPS does not have sufficient information to make an informed decision on the ROW and special use permits. We deemed the applications for the ROW and the special use permits from the developer sufficient to proceed to their consideration. The DEIS was supposed to analyze the specific activities proposed in the permit applications under NEPA and Section 106 of the NHPA and analyze and disclose the environmental effects of these proposed activities. The DEIS does not appear to have adequately done so with respect to the activities subject to NPS permitting decisions. To summarize our main concerns: The alternative landfall sites analysis does not contain adequate information on the reasons other landfall locations were dismissed	Thank you for your comment. Additional information has been added to Chapter 2 of the Final EIS to address your concerns.

NPS Comment	Response

from further consideration. Among other issues, the need for a barge under the proposed action was never included in the analysis of alternative landfall locations.
• The proposed action description and analysis of effects is insufficient:
  ○ In analyzing the impacts on recreation at the proposed landfall; and
  ○ In describing the following project elements regarding:
  ○ The cable landfall, and
  ○ The use of the proposed barge.
• The reasonably foreseeable actions under Alternative A are incorrect and include actions the NPS is legally unable to authorize.
• Analysis of impacts to FIIS and the Otis Pike Fire Island High Dunes Wilderness (Wilderness) have not been adequately disclosed.	

As you know, the EIS must "[e]valuate reasonable alternatives to the proposed action, and, for alternatives that the agency eliminated from detailed study, briefly discuss the reasons for their elimination." 40 Code of Federal Regulations (C.F.R.) § 1502.14(a); see also 43 C.F.R. § 46.415(b). Reasonable alternatives must be "technically and economically practical or feasible and meet the purpose and need of the proposed action." 43 C.F.R. § 46.420(b); see also 40 C.F.R. § 1508.1(z). While acknowledging that only a brief discussion of reasons for eliminating alternatives from detailed study is required, the NPS is concerned that the DEIS does not sufficiently address alternative landfall sites, including landfall sites that would avoid traversing FIIS. The explanation and reasons why those alternative landfall sites were eliminated should be expanded or instead one or more alternative landfall sites should be treated as Alternatives in Chapters 2 and 3 of	Thank you for your comment. Additional information has been added to Chapter 2 regarding why these alternative landfall sites were dismissed from further consideration.

NPS Comment	Response
the EIS.	
The project developers in discussions with the NPS, and the material in the DEIS provided information describing five other landfall locations in addition to Smith Point County Park and its two eliminated landfall variations within the County Park. The five alternate landfall sites are: 1. Village of Quogue Beach, Town of Brookhaven, NY 2. Coopers Beach, Southampton, NY 3. Rogers Beach, Westhampton, NY 4. Bellport Bay, Town of Brookhaven, NY 5. Bluepoint Marina / Corey Beach, Town of Brookhaven, NY Section 2.2 of the DEIS and Appendix P to the DEIS, which contains Section 404(b)(1) analysis by the U.S. Army Corps of Engineers (USACE), briefly address the alternative landfall sites considered and excluded from further consideration, as does Section 3.6.5 "Land Use and Coastal Infrastructure" of the DEIS, though with fewer specifics. According to the DEIS, the Bellport Bay and Bluepoint Marina sites were eliminated from further consideration as they would have likely required crossing of FIIS through the Wilderness area. This would not be allowed, rendering these landfall sites infeasible. We therefore agree with eliminating these two sites from further consideration.	Thank you for your comment. Additional information on these landfall sites was added to Chapter 2, Section 2.2.
However, the rationales for eliminating from consideration the other three sites, i.e., Village of Quogue Beach, Coopers Beach and Rogers Beach, merit further discussion. Those sites were each described as having certain exclusionary characteristics, without quantifying the nature of those exclusionary reasons. For instance, all three were described as including "the fact that the onshore portion of the transmission cable would be longer than the preferred alternative" (DEIS, Appendix P under Logistics in Table P-2 on page P-5). However, information on the lengths of these onshore cables was not provided. The map in Appendix P (Map P-2 on page P-10) shows the general	The information provided in Appendix P to the Final EIS specifically supports the Section 404(b)(1) analysis conducted by the United States Army Corps of Engineers (USACE). Detailed route feasibility is not completed for all landfall options at an early stage, particularly if a landfall location is not advanced for further consideration. While detailed routes were not evaluated, the general distance between the landfall and the Holbrook Substation provides indicative distances. Each of the alternative landfall sites would have an onshore cable route to the Holbrook Substation that is at least 25 mi (40.2 km; Rogers Beach is approximately 25 mi [40.2 km] from

NPS Comment	Response
locations of each of the alternatives dropped from consideration but not their onshore routes. If the alternative can be characterized as "longer", the exact length and route must be known. We don't know how much longer each of the alternative transmission cable routes would be. We don't know what challenges or opportunities each route might present. The exact mileage, route and route characteristics that could impact siting should be provided.	Holbrook, Quogue Beach is approximately 30 mi [48.2 km], and Coopers Beach is approximately 38 mi [61.2 km]). Given these indicative distances, the routes would be 50 percent to 125 percent longer than the route between Smith Point County Park and the Holbrook Substation, which is 17 mi (27.4 km). This information was added to Section 2.2 in Table 2.2-2.
Similar reasoning was used under Cost, "This landfall option would result in a longer onshore transmission cable route when compared to the preferred alternative; therefore, would result in higher overall costs" (Appendix P in Table P-2 on page P-5). Again, no information is presented on the cost to make a comparison. If the alternative can be characterized as "higher cost", at minimum the approximate cost must be known to conclude that it was higher. An estimate of the cost of each alternative should be provided; that information speaks directly to the economic feasibility of potential landfall sites.	Detailed cost estimates are not generated for all routes at an early stage, particularly if a landfall location is not advanced for further consideration. Onshore transmission cable costs, particularly at the earlier stages of alternatives analysis and route feasibility, are estimated on a per-mile basis. Given that the routes are approximately 50 percent to 125 percent longer than the route associated with the proposed landfall from Smith Point County Park, the costs would also be approximately 50 to 125 percent higher. This information was added to Section 2.2 in Table 2.2-2.
The assessment of impacts to the aquatic environment used similar reasoning, "Site excluded due to the fact this route would result in greater terrestrial disturbance due to the increased length of the transmission route and/or potential conflicts with existing aquatic resources and anthropogenic uses" (Appendix P in Table P-2 on page P-7). The first part of this explanation is again tied to the length of the onshore route without information on the length of that route. The second part refers to potential conflicts with existing aquatic resources without an explanation of what the potential conflicts might be or even a description of the existing aquatic resources particular to each alternative. The final part of this explanation refers to anthropogenic uses, again without an explanation of human uses at each location or a comparison of said uses. As above, some analysis must have been done to come to these conclusions. That analysis should be	Appendix P of the Final EIS includes the Section 404(b)(1) analysis conducted by the USACE. Table 2.2-2 in Chapter 2 was added to support NPS decisions on alternative route feasibility, and details were added. However, detailed route feasibility was not completed for landfall sites that were excluded from further consideration based on potential conflicts with existing aquatic resources, such as wetlands, streams, or other sensitive resources, or anthropogenic uses, such as the proximity to cultural or historic resources and proximity to the number of residences. These conflicts have been identified as potential, as additional site-specific surveys were not completed once the alternative route had been determined not to be a feasible option. Part of this determination included the length of the proposed cable route. Additional information on the length of the onshore transmission cable has been added to Section 2.2 of the

NPS Comment	Response
summarized in the EIS.	EIS. Further analysis of routes that were not considered are not included in the EIS because they are not a part of the action put forward by Sunrise Wind and are not described in the COP.
The last two categories that the USACE analyzed potentially point to differences between alternative landfall sites, but here too, not enough information is presented. Under "Impacts to USACE Civil Works Projects," the table lists the two excluded Smith Point County Park options as "Similar proximity to [the Fire Island Inlet to Montauk Point Project] (FIMP) as preferred Landfall [horizontal directional drilling] HDD" at Smith Point County Park (Appendix P in Table P-2 on page P-8). But there is no description that we could find of the proximity to FIMP for the preferred landfall site, making it difficult for the reader to understand how the preferred landfall compares to the other alternatives in its proximity to FIMP.	The entry location for the Landfall HDD will be in a parking lot 755 ft (230 m) landward from the FIMP. The exit location for the Landfall HDD will be 2,525 ft (770 m) seaward from the FIMP. The cable will be installed at a depth of approximately 60 ft (18 m; NAVD 88) below the 0' datum where the FIMP is located. The entry location for Landfall HDD B would be located adjacent to the proposed Landfall HDD entry location (approximately 495 ft [151 m] landward of the FIMP), and the exit location and depth for Landfall HDD B would be the same as the proposed Landfall HDD (approximately 2,525 ft [770 m] seaward from the FIMP and approximately 60 ft [18 m] below the 0' datum). The entry location for Landfall HDD C would be located just west of the proposed Landfall HDD entry location (approximately 541 ft [165 m] landward of the FIMP), and the exit location for Landfall HDD C would be just west of the proposed Landfall HDD (approximately 1699 ft [518 m] seaward from the FIMP). The depth of Landfall HDD C would also likely be approximately 60 ft (18 m) below the 0' datum. The other potential landfall locations are also located in parking lots, and thus, entry locations for those HDDs would likely be 272-374 ft (83-114 m) landward from the FIMP. HDD exit locations, while not specifically designed, would also likely be 3,280-4,921 ft (1,000-1,500 m) seaward from the FIMP but would be restricted by the location of sand borrow areas. Detailed geophysical and geotechnical (G&G) surveys or route engineering have not been conducted at other potential landfall locations, and thus, precise lengths, locations, and depths cannot be determined. Without detailed G&G surveys and further engineering design, it also cannot be concluded that a single

NPS Comment	Response
	HDD would be able to be used. Up to three drills may need to occur at other potential landfall locations (i.e., one for each of the conduits and a spare, as was originally proposed for the Landfall HDD). This information has been added to Chapter 2 and Section 3.18.5.1.1.
This Civil Works section states, "The proposed landfall at (Coopers and Rogers Beach) has the potential to impact existing sand borrow areas, as well as civil works beach renourishment projects such as FIMP" (Appendix P in Table P-2 on page P-8). But this "potential" to impact sand borrow areas is not described at all, nor are possible impacts or proximity to FIMP. The Village of Quogue Beach is described as, "The proposed landfall at Quogue Beach would not impact any Civil Works Borrow Areas, however, will potentially impact civil works beach renourishment projects such as FIMP" (Appendix P in Table P-2 on page P-8). Again, there is no information provided on any potential impacts or proximity to FIMP.	Additional information was added to Chapter 2 in Section 2.2 to address these comments.
The final category USACE analyzed was "Impacts to Special Aquatic Sites." The table lists the two excluded Smith Point County Park options as "Similar impacts as preferred Landfall HDD" (Appendix P in Table P-2 on page P-8). Appendix P defines special aquatic sites as Impacts to Special Aquatic Sites (wetlands, mudflats, vegetated shallows etc.) and lists "none" for such sites at the preferred landfall location at Smith Point County Park, (Appendix P in Table P-1 on page P-4). But the definition of "Impacts to Special Aquatic Sites" seems to have expanded in analyzing the other alternatives, "In the offshore vicinity of Cooper's Beach there are constraints that limit potential cable placement including mapped shipwrecks and a scuba-diving area" (Appendix P in Table P-2 on page P-8). The analysis fails to include the swimming, surfing and fishing areas on the ocean side that could be impacted by the proposed landfall cable construction and the	The information included in Special Aquatic Sites in Table P-2 of Appendix P is defined by USACE to include wetlands, mudflats, and vegetated shallows and is focused on discussing impacts on the aquatic environment. This analysis of landfalls by the Applicant did not include swimming, surfing, fishing, or scuba diving activities in the area. Please see Section 3.21.5.1 of the Final EIS for further discussion of construction impacts on the recreation and tourism activities described in the comment.

NPS Comment	Response
scuba-diving area on the bay side at Smith Point County Park that could be impacted by the barge activities. There are no impacts to special aquatic sites listed for Rogers Beach.	
The analysis in Section 2.2 of the DEIS also calls into question the decision to drop all the other landfall alternatives. "The Smith Point County Park landfall site would result in the least disturbance to recreational and commercial fisheries, recreational boating, and impacts to designated wilderness areas" (DEIS at 3-619). The analysis in the DEIS does not contain sufficient information to support this conclusion. While it is true that the Bellport Bay and Bluepoint Marina / Corey Beach sites proposed by the developers would have traversed the wilderness area, the other three dropped alternative locations are much farther away from the Wilderness area than Smith Point County Park which is immediately adjacent. There is no comparison of the alternatives with the proposed landfall at Smith Point County Park presented in the DEIS for recreational and commercial fisheries, and recreational boating. Further, it is unclear why recreational boating has been considered, but other forms of recreation apparently have not been considered. This analysis should address all forms of recreational use, especially beach use as beach use is common across all sites. The NPS asks that the analysis to conclude that the proposed location "would result in the least disturbance" be expressly addressed in the EIS.	Thank you for your comment. Since the development of the Draft EIS, BOEM has worked with NPS to address these concerns and has added Table 2.2-2 and additional discussion in Section 2.2 and Chapter 3 about the alternative landfall locations considered and reasons for dismissal. The recreational impacts of the alternative landfall sites were not further discussed in Section 2.2 because they were dismissed as potential alternatives for different reasons. They were not a factor in dismissing the alternatives and were therefore not analyzed and discussed further once the sites were dismissed from consideration.
Quantified information tied to the qualified statements above must have been calculated and known in order to characterize a site route as "longer than" or "higher cost than." Data must have been considered in order to determine certain landfall sites had the "potential to impact" or would generate the "least disturbance." Without these details, the NPS lacks relevant environmental information that informs whether the Village of Quogue Beach,	Additional information regarding the route lengths has been added to Chapter 2, Section 2.2. Detailed information regarding the costs is not available since these sites were excluded for other reasons initially.

NPS Comment	Response
Coopers Beach, and Rogers Beach landfall sites are appropriately eliminated from further consideration or should be analyzed in more detail as an Alternative carried forward in the EIS.	
One of the critical elements of the proposed landfall location at Smith Point County Park is the need for a barge to haul heavy machinery, equipment, and supplies to and from Smith Point County Park parking lot and the attendant landfalls for the barge on each side of the Intercoastal Waterway. The DEIS description of the proposed action and the analysis of the impacts of the proposed landfall location failed to meaningfully include this required element of the project. The comparison of potential landfall alternatives also failed to include this element even though it has a direct effect on the cost of the alternative and potential impacts to aquatic communities, as well as the potential for hazardous spills and possible attendant impacts to the Wilderness should an accident occur.	A description of the barge activities has been added to the Final EIS in Chapter 2 under the Proposed Action (Section 2.1.2). It is unknown if other alternative landfall sites would require a barge; this was addressed in Table 2.2-2.
As far as the NPS is aware, none of the other alternative locations need a barge and landing locations. Since the cost of the onshore power cable to the substation was listed as a contributing factor to the other landfall alternatives being eliminated from consideration, the cost of the barge, fuel, and barge landing locations creation should be included when considering the cost of landfall at the Smith Point County Park location.	A potential landfall at the Village of Quogue Beach would require the use of the Quogue Bridge to transport HDD equipment to the barrier island. Based on a review of information from Suffolk County, Quogue Bridge has a posted load weight limit of 20 tons, and thus, some equipment would not be able to cross the bridge. However, the barrier island in this area is also accessible by the Beach Lane Bridge and the West Bay Bridge, both located in the town of Westhampton Beach, neither of which currently has a posted weight limit. A potential landfall at Rogers Beach would also require the use of the Beach Lane Bridge or the West Bay Bridge. Discussions with relevant authorities would be required to confirm the transport of oversized or overweight loads, but it is assumed that neither location would likely require the use of a barge system. Coopers Beach is not located on a barrier island and thus would not require the use of a barge system.

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	The costs for the Smith Point Landfall do consider the use of the temporary landing structure and the barge use system.
In order that the NPS can understand the effects of its decision on whether to issue the ROW and special use permits (SUPs), we need either additional analysis confirming that the Village of Quogue Beach, Coopers Beach, and Rogers Beach landfall sites are impracticable and/or infeasible or, if one or more alternative sites are feasible and practical, then we need a full alternative analysis of a cable landing at one or more of those landfall sites. This would include fuller factual details on the alternatives and the reasons to eliminate or carry forward those alternatives, as well as the level of analysis needed in order to make an informed decision, much of which is described elsewhere in this letter. How this would be carried out, whether by a supplemental DEIS, a new appendix in the Final EIS, or some other process would need to be coordinated.	This information was added to Table 2.2-2 in Section 2.2.
The NPS believes the proposed action description and analysis of effects is insufficient in addressing 1) the impacts on recreation; 2) the cable landfall construction and impacts both in Smith Point County Park and in FIIS waters; and 3) the need for and use of the barge as a component of the project at the proposed location. We address each below	Thank you for your comment. Your concerns outlined below are addressed throughout the Final EIS and within this comment matrix.
The assessment of impacts on recreation and tourism at the proposed landfall is inadequate in the DEIS. There seems to be a disconnect in how accessible Smith Point County Park and FIIS would be once construction started and the means the recreating public could use to gain access to the Smith Point County Park and the National Seashore.	Pedestrian and public access to the parking lot and park facilities will be maintained throughout construction at Smith Point County Park. Access will be maintained for continual pedestrian and vehicular access to park amenities within Smith Point County Park on Fire Island, the Smith Point Marina on the mainland, and all other existing public access areas. Similarly, Sunrise Wind's use of the Temporary Equipment 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 an

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	access point to the fishing pier). To further expand on this information, Sunrise Wind has committed to maintaining access to all roads and the Smith Point County Park parking lot during construction. Therefore, no road closures will be required. Only an occasional and short-term interruption of a few minutes is possible during certain points of the construction to maintain safe operations. The work area/Limit of Disturbance located in the fenced area west of the Smith Point Bridge, where the new ICW HDD will exit, is the only area that will be closed during construction activities. Closures will be limited to the offseason and will overlap with locations that will be permanently impacted by the new Smith Point Bridge. The public will still have access to the Fire Island Wilderness Visitors Center and other trails and areas west of the bridge during construction. Sunrise Wind has also committed to avoiding all work within Suffolk County Parks during the summer tourist season (Memorial Day to Labor Day); therefore, impacts to recreational users will be temporary and minimal.
In regard to recreation and tourism, the DEIS states: "Some recreation and tourism activities occur year-round, and there is the potential for activities to occur that affect public access. Public access to Smith County Park would not be allowed during construction activities. Additionally, public access could be limited to specific areas of the Fire Island National Seashore. However, the level of this impact would be directly associated with the time of year that construction activities would occur" (DEIS at 3-699). It is not apparent in the DEIS that BOEM is aware that vehicle access to Smith Point County Park and FIIS in this area is limited to the Smith Point Bridge on the William Floyd Parkway. The bridge essentially dead ends at Smith Point County Park. If public access to the Smith Point County Park would not be allowed during	Section 3.21.5.1.1 has been revised to clarify that Sunrise Wind has committed to maintaining public access to all facilities at Smith Point County Park and Smith Point Marina unless temporarily necessary for safety purposes, and therefore, access to NPS-managed areas would be maintained. Construction activities may result in a reduction of access to some parking areas or changes in traffic flow but would not prevent access to Smith Point County Park or the recreation and tourism areas that are accessed from this point.

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construction activities, then access to the County Park, the Wilderness Area, and other parts of FIIS would be essentially prohibited. Surfing, hiking, birding, and photography are year-round activities at FIIS, with fishing and hunting seasonally restricted to the areas of the FIIS accessible from Smith Point County Park. Additionally, the Wilderness Visitor Center (adjacent to Smith Point) is one of only two NPS sites open for visitors year-round on FIIS. While there are ferries and other water-borne transportation options, they run most often during the busier times of the year and would not disembark in this area. The closest ferry and water taxi service would be to Watch Hill which is 7 miles away from the Wilderness Visitor Center/Smith Point area. Neither of those provide service after Columbus Day. These matters should be clarified in the EIS so that the NPS and the public have the relevant information necessary to understand the proposed project's effects on recreation and visitor access.	
In a separate section regarding land use and coastal infrastructure and discussing proposed construction activities, the DEIS says, "Access to the landfall area would be maintained through Smith Point County Park and would not traverse portions of the Otis Pike Wilderness area or other portions of the Fire Island National Seashore. Vehicles would include heavy equipment, such as excavators, cranes, dump trucks, and paving equipment" (DEIS at 3-630). This passage from the DEIS is confusing and should be revised for clarity. Which equipment and vehicles would arrive by barge and which via the bridge? As we note above, in the absence of any discussion of the barge, one would assume that those vehicles would drive to the County Park. Secondly, "access to the landfall area would be maintained" appears to only refer to construction vehicles during most of the year as "Public access to Smith County Park would not be allowed during construction activities." Please clarify when and how the recreating public would	Text was added to Section 2.1.2.1.19 clarifying what equipment would be transported by barge and public access availability.

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have access to the County Park and this side of FIIS outside of the summer season.	
The reason the barge is needed is because the Smith Point Bridge is no longer capable of the safe passage of heavy loads so the carrying capacity of the bridge has been lowered. The bridge must be replaced. Construction is reported to start in 2024 and conclude in 2027. The old bridge will remain in place while the new bridge is constructed, which means it will have a different footprint than the current bridge. According to the most recent material on the bridge replacement project from Suffolk County, NY, the new bridge will be built approximately 150 feet west of the current bridge. This would place it squarely within the footprint of the proposed westernmost work area and HDD landfall for the onshore transmission cable for the Sunrise Wind Project (DEIS at 3-618). There is also the question as to whether waterborne passage under the new bridge footprint and old bridge would even be allowed or physically possible during bridge construction, thus potentially limiting the use of the barge or changing where the barge would have to embark on the mainland side. The DEIS does not address how the two projects could occur concurrently nor how the proposed onshore transmission cable would stay in place should Sunrise Wind proposed work be completed first. Given that the bridge construction period appears to overlap with the landfall construction, the two construction timelines and footprints within the County Park must be evaluated and the impacts and challenges of this concurrent work disclosed in the EIS.	Sunrise Wind has been closely coordinating with Suffolk County authorities with design review meetings since 2019 to ensure the siting, workspace limits, design specifications, and installation timelines for the Project do not conflict with the Smith Point Bridge replacement project. Sunrise Wind continues to hold check-in meetings to share Project updates and discuss construction timelines to ensure conflicts are avoided or minimized to the extent practicable. Currently, Sunrise Wind anticipates completing construction activities that would overlap with the bridge replacement project areas (the ICW HDD and Onshore Transmission Cable installation) prior to the start of the County's project and will continue to coordinate schedules as the start of construction nears. Waterborne passage along the ICW through the bridge areas will remain possible throughout the bridge construction. Information has been added to Section 2.1.2.1.1.9.
The DEIS shows the work areas within the landfall at the County Park (DEIS at 3-618). As noted above, "Access to the landfall area… would not traverse portions of the Otis Pike Wilderness area" (DEIS at 3-630). The map and key show the westernmost work area as likely tens of feet from the Wilderness boundary. Please provide the best estimate	The text was added in Section 2.1.2.1.1.9, and Section 3.18.5.1.1 has been revised to clarify the Limit of Disturbance from the Proposed Action in relation to the Otis Pike Wilderness Area. The closest Project disturbance to the Otis Pike Wilderness Area would occur approximately 65 ft (20 m) east of the wilderness boundary. All site

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of the distance from the work area to the Wilderness boundary and the measures that would be proposed to ensure that construction work does not enter or directly impact the Wilderness Area.	disturbances would be confined to the Project's Limit of Disturbance per requirements from New York State, which will be delineated prior to construction. This line will be inspected and maintained until restoration activities are completed to ensure that construction activities do not occur in the Otis Pike Wilderness Area. An existing split rail and chain link fence contains areas west of the Limit of Disturbance, which is anticipated to provide additional protection during construction activities.
That same section of the DEIS also states, "The landfall site within Smith Point County Park is adjacent to the federally designated Otis Pike Wilderness Area. Land uses in the adjacent wilderness area would also be impacted due to land disturbance activities from construction activities. These impacts to adjacent land uses are anticipated to be moderate during the construction period. The Landfall Work Area would have a maximum disturbance of 6.5 acres (2.6 ha). To help minimize impacts, Sunrise Wind proposes an [applicant proposed measure (APM)] to complete construction activities to the extent possible in the off season of Smith Point County Park, which occurs from November 12 to March 31 annually; however, some construction activities may extend beyond that window (Suffolk County Parks 2018)" (DEIS at 3-628). The NPS does not agree that "impacts to adjacent land uses are anticipated to be moderate during the construction period" if the recreating public cannot reasonably access the area. We are also concerned with the statement that "some construction activities may extend beyond that window" both from an access to recreation standpoint and impacts to threatened and endangered wildlife as we address below.	Sunrise Wind has committed to maintaining public access to all facilities at Smith Point County Park during construction, which would allow for the recreating public to access the area. Sunrise Wind has also clarified the proposed APM, which has been revised in Section 3.22.5.1.1. The parking lot in Smith Point County Park will have reduced capacity during Landfall construction activities, but access to this and the surrounding areas will still be possible. Sunrise Wind has committed to maintaining access to all roads and the Smith Point County Parking lot during construction, with no road closures required. The only area that would be closed during construction activities is the Limit of Disturbance, which is located in the fenced area west of the Smith Point Bridge, where the new ICW HDD will exit. Closures to this area would be limited to the offseason and would overlap with locations that will be permanently impacted by the new Smith Point Bridge. During construction activities, public access to the Fire Island Wilderness Visitor Center and all other public trails and areas west of the bridge would be maintained.
The NPS urges that the EIS (1) provide greater detail and specificity regarding the schedule for construction within FIIS boundaries, (2) clarify what access, if any, the public will have to Smith Point County	(1) Table 2.1-4 of the EIS presents the onshore proposed construction schedule that Sunrise Wind has provided in the EM&CP. However, it should be noted that this proposed schedule is

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Park during the construction activities, (3) state all public access limitations to FIIS anticipated to be caused by the proposed construction activity, and (4) denote FIIS and Wilderness Area boundaries on relevant maps and in relevant descriptions. Further, if the public will have no reasonable access to the area during construction, that impact should be described as “major,” rather than moderate. In addition, the NPS does not agree with the conclusion that Alternative B’s impacts on recreation and tourism would be “negligible to moderate; minor beneficial” (DEIS ES-xiii) if recreational access is cut-off for a significant part of a year or several years. If BOEM requires additional information from the NPS, such as additional maps or information on recreational use patterns, please let us know.	dependent upon the receipt of permits. (2) Sunrise Wind is committed to maintaining access to Smith Point County Park during construction activities; however, access could be reduced during certain construction activities, such as reductions to parking spaces in the Smith Point County Park parking lot during landfall construction. No construction activities would occur in Suffolk County Parks between Memorial Day and Labor Day. (3) Public access limitations could include changes in traffic flow or reductions in parking spaces but continued access to recreation and tourism areas would be maintained throughout construction unless temporary restrictions are needed to maintain public safety. No public access limitations to FIIS are anticipated. (4) Relevant maps have been revised as needed. (5) Recreational access would not be cut off for a significant part of a year or several years. Major impacts to recreation and tourism are defined as "the affected activity or community would have to adjust to significant disruptions to large local or notable regional adverse impacts of the project." Construction activities would not prevent recreation and tourism activities from occurring in the area, and thus, BOEM feels that moderate impacts are a more appropriate description, which is defined as "the affected activity or community would have to adjust somewhat to account for disruptions due to the project." Recreationalists may have to adjust somewhat due to the Project, but it would not prevent users from being able to do the same activities that are currently available in the region and would not prevent access to any areas. At most, interruptions of a few minutes could be possible during certain points of construction for public safety purposes.
The DEIS does not sufficiently analyze the impacts of bringing the	All Project infrastructure within the FIIS boundary would occur

NPS Comment	Response
power cable ashore through NPS-administered waters from the wind farm. Nor have the actions within Smith Point County Park, and analysis of their impacts which could affect NPS resources, been well described. The most glaring omission is the lack of any description of the HDD operation and conduit placement to run the power cable through the conduit to shore through submerged lands over which the United States holds an easement for use and occupation for purposes of FIIS.	below the seabed, with the exception of a temporary landing structure. The temporary landing structure would include temporary disturbance of the seafloor of up to 150 ft^2 (46 m^2) for the placement of steel piles that would support the structure. The Landfall HDD entry location would be located in the parking lot, and no trenching would occur on the beach. Text was added to Section 2.1.2.1.1.9 describing this.
More complete construction details for work in Smith Point County Park and in FIIS submerged lands, along with analysis of the impacts of that work, are needed to understand potential impacts to NPS resources. The EIS should expressly address the following issues: - Would the underwater HDD reach the parking lot or end short of the parking lot (on the beach) with open trench or some other method for the remaining distance? - What is the number and size of manholes or underground containment for the cable junctions? What is the weight? How will they be transported to the parking lot? Will the construction use prefab or poured concrete? These concerns speak to barge transport and impacts to Wilderness, etc. such as noise, lighting, and dust. - What construction method would be used to avoid existing infrastructure? - Conduit welding details need to be described: Where would it take place? How long would it take? What happens to the conduit if it has to remain in Smith Point County Park over time (over the summer or over a complete year(s))? What will be the impacts to the recreating public? Would areas be excluded from recreation use during the peak season and/or over the rest of the year? - Overall construction schedule with details as to what would happen, when, and where are not explained, including a definition of “off	Additional text and a table, including the construction schedule, have been added to Chapter 2, Section 2.1.2.1.

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periods" with no construction. The only construction period timeline we've seen does not show any non-construction periods and seems to start this fall before the final EIS and ROD would be issued. - Description of the disturbance to the seafloor within FIIS boundaries and its impacts? - Please provide a description of the disturbance to the seafloor within FIIS boundaries and its impacts.	
The DEIS does not contain sufficient information on the barge landing locations, operations, and transit through the FIIS-administered water column and associated habitat. The NPS must have this information to understand the potential impacts we would be allowing by issuing a SUP for transit through waters over which the NPS has jurisdiction and in order to set adequate terms and conditions in such a permit.	The barge(s) would be operated between the Smith Point Marina and the Smith Point County Park parking lot. Loads in excess of 15 tons would be transported via barge. Trailers would be driven directly onto the barge, transported, and driven directly off the barge. The barges would be maneuvered using a 700-HP push boat. Currently, barge operation would occur continuously between the hours of 7 am and 7 pm, and approximately six to eight loads per day are anticipated. Assistance from the drawbridge operator would be required to allow the barge to pass under the Smith Point bridge. Text has been added to Chapter 2 that explains anticipated barge operations, and a map of locations has been included in Section 2.1.2.1.1.7.
The information that should be stated in the EIS includes the proposed actions addressed below, along with the impacts of those actions: - How would the barge be built? Is there a particular construction method or location where the barge would have to be built? - If commercial applications / barge models are being considered or have been secured, which company would supply these services, what model of barge would be used, and what has been the history of use of this barge for this proposed use? In these proposed conditions and at the proposed time of year (which is itself unclear)? - What construction methods would be used for the landing locations, including the onshore anchoring techniques, design and impacts?	The requested information was added to Section 2.1.2.1.1.9.

NPS Comment	Response
- How many trips does the developer anticipate making with the barge? How often? During which seasons of the year? - What equipment and materials would the barge carry? What would be the average weight carried per trip? The maximum weight to be carried? The DEIS described the need for "heavy equipment, such as excavators, cranes, dump trucks, and paving equipment" (DEIS at 3-630). The DEIS explanation did not describe how this equipment would arrive on site. Most readers would assume that these vehicles would drive across the bridge given the description. But we know this to be untrue as the bridge is no longer capable of carrying heavy vehicles, hence the need for the barge. - What methods would be used to secure the equipment and supplies to the barge? - What hazardous materials would be carried on the barge and contained in the equipment and machinery, such as oil, gas, antifreeze, etc.? - What habitats will be impacts (e.g. eelgrass beds, mudflats, wetlands) and what mitigation is proposed, if any, to address these impacts? - What method of propulsion and fuel would the barge use? Would the barge be pushed / pulled by a tugboat? If so, what size tug and would any tug mooring facilities be needed at the landfall? - What permits or authorizations from the US Coast Guard and / or the USACE would be needed to approve the barge use? - Have spill response, safety and emergency plans been prepared? The NPS will need to see such plans before issuing any permits. The answers to these questions will be critical in determining impacts of the barge on park resources, including the Wilderness area, and human health and safety, and terms and conditions we would need to include in the special use permit that would have to be issued.	

NPS Comment	Response
The DEIS lists a number of actions BOEM states would still occur should Alternative A, the no action alternative, be selected. In describing the DEIS's methodology for assessing impacts, the DEIS states: "Ongoing and planned actions occurring within the geographic analysis area [GAA] include (1) other offshore wind energy development activities; (2) undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); (3) tidal energy projects; (4) marine minerals use and ocean-dredged material disposal; (5) military use; (6) marine transportation (commercial, recreational, and research-related); (7) fisheries use, management, and monitoring surveys; (8) global climate change; (9) oil and gas activities; and (10) onshore development activities" (DEIS at 1-13 to 1-14). Similar statements are made regarding impacts on particular resources, e.g., DEIS at 3-691 ("Ongoing non-offshore wind activities within the GAA that contribute to impacts on recreation and tourism include undersea transmission lines, gas pipelines, other submarine cables, tidal energy projects, marine minerals use and ocean dredged material disposal, military uses, marine transportation, fisheries and management, global climate change, oil and gas activities, and onshore development activities. These activities are expected to continue at current trends and have the potential to affect recreation and tourism."). However, this list is not accurate in determining reasonably foreseeable actions at the proposed landfall site. This description applies across the GAA and is not specific to the landfall area. Many of the above activities do not now and likely never would occur at the proposed landfall site. For examples, oil and gas activities will not be authorized at FIIS because the NPS does not have legal authority to do so. The NPS is also not likely to allow tidal energy projects, marine minerals use, ocean dredged material disposal, military uses, or	The discussion of impacts that could occur within the GAA for recreation and tourism activities is found in Section 3.21. The Recreation and Tourism GAA includes the following: • All Project components, plus a 40-mile radius from the WTG array; • Resources adjacent to the landfall construction area, including land within the Fire Island National Seashore boundary, Smith Point County Park boundary, and Otis Pike Wilderness boundary; • 1,000 feet into the Atlantic Ocean and 4,000 feet into Great South Bay, located within the boundary of the Fire Island National Seashore; • A three-mile radius around the proposed OnCS-DC site (Union Avenue site); and • Portions of the towns of Brookhaven and Islip, along with small portions of the villages of Lake Grove and Patchogue and the cable landfall and cable routes to the OnCS-DC site. The reasonably foreseeable actions considered in this EIS must consider the entire GAA and not just the reasonably foreseeable actions that would occur at the proposed landfall site.

NPS Comment	Response
marine transportation as these activities are not authorized by law within park boundaries and/or do not fit with the purposes of the Park. The EIS should contain a description of the impacts of the no action alternative to activities that are reasonably likely to occur at the proposed landfall location. The NPS would be happy to provide the exact language for BOEM use in the EIS regarding the impacts of the no action alternative at the landfall site.	
The Wilderness Area is directly adjacent to the Sunrise Wind landfall location and Smith Point County Park. Yet the DEIS doesn't adequately address possible impacts from the proposed project on the Wilderness Area. In particular, the DEIS sections on Wilderness impacts: Section 3.4.2.5.1.1 Water Quality, Onshore Activities and Facilities, Seafloor/Land disturbance (pg. 3-46); 3.6.5 Land Use and Coastal Infrastructure (pgs. 3-619, 3-628 to 3-629) downplay any potential impact. Please include in the EIS the bases for the statements that landfall at Smith Point County Park has "minimal conflicts with adjacent land uses," and will result in "minimal disruption to adjacent land uses" and various resources, particularly in light of the adjacent Wilderness Area, which is to be left "unimpaired for future use and enjoyment as wilderness," with its "wilderness character" preserved 16 U.S.C. § 1131 (purposes of National Wilderness Preservation System); see also 16 U.S.C. § 459e-6(a) ("The Secretary shall administer and protect the Fire Island National Seashore with the primary aim of conserving the natural resources located there."); 16 U.S.C. § 459e-6(b) ("every effort shall be exerted to maintain and preserve" the Otis Pike Fire Island High Dune Wilderness "in as nearly [its] present state and condition as possible").	Impacts to adjacent land uses, including the Otis Pike Fire Island Wilderness Area, would be temporary, localized, and indirect. BOEM anticipates that these impacts would be minimal because they should not permanently change the character of the adjacent areas and should not change the land uses that currently occur or would occur in the future. Additional discussion concerning the Otis Pike Fire Island Wilderness Area has been included in the Final EIS, including in Sections 2.1.2.1.1.7, 3.18.5.1.1, and 3.21.11.
The NPS is particularly concerned with the potential for an accidental release or discharge. The DEIS states, "Accidental releases and	As is stated in Section 3.18.5.1.1, the description of equipment mounted on concrete foundations with a secondary oil containment

NPS Comment	Response
discharges would potentially have negative impacts on land use to Fire Island National Seashore waters and onshore Otis Pike Wilderness Area. Releases and discharges could result in disruptions to land use in these areas by potentially causing for areas utilized by visitors to be temporarily closed due to the presence of fuel/fluids/hazardous materials and negatively influencing the wilderness area by polluting the area. …Equipment would be mounted on concrete foundations with a concrete secondary oil containment designed in accordance with industry and local utility standards. In addition to this, Sunrise Wind would develop a Spill Prevention, Control, and Countermeasure Plan to help minimize any potential impacts during construction" (DEIS at 3-627). A more detailed description showing where and what equipment would be mounted on concrete foundations with concrete secondary oil containment should be provided. We do not recall seeing this information elsewhere in the DEIS. The NPS would want to review the Spill Prevention, Control, and Countermeasure Plan prior to issuing permits to ensure NPS resources are identified and would be adequately protected, and appropriate NPS contacts are listed. Terms and conditions specific to the Spill Plan may also be added to NPS permits.	structure describes the Onshore Converter Station (OnCS-DC) and is not relevant to any construction activity at the Landfall HDD site or ICW HDD. Sections 3.18.5.1.1 and 2.1.2.1.1.9 have been further revised to add more detail related to the Spill Prevention Control and Countermeasure Plan proposed by the Applicant.
Should unforeseen events such as a Wilderness area clean-up from a spill, the barge becoming unmoored and landing in the Wilderness, or equipment that fell off the barge land in the Wilderness, analysis in the form of a Minimum Requirement Analysis (MRA) and clean-up implementation that adhered to this analysis would be required. This further underscores the need to avoid such events and for the NPS to be involved in the Spill Prevention, Control, and Countermeasure Plan and any other emergency project planning.	Sunrise Wind has filed SPCC plans through the EM&CP process, as well as COP Appendices E1 and E2. All site disturbance will be confined to the Project Limit of Disturbance, which does not include the Otis Pike Wilderness Area or the Fire Island Wilderness Center. NPS has indicated in a follow-up comment that they intend to require the Lessee to provide NPS an opportunity to review emergency plans (including the SPCC) for emergencies that may impact wilderness areas in connection with any NPS permits to be issued.

NPS Comment	Response
Water Quality Concerns The potential water quality impacts to Great South Bay, Narrows Bay, and Moriches Bay from the floating barge have not been addressed. See our questions and comments about the barge and its landings above. The water quality impacts within FIIS boundaries from the Sunrise Wind Project as a whole have not been adequately addressed. DEIS at 3-31: The sentence describing water resources administered by the NPS appears incomplete. Revise it to say: "The NPS has administrative authority over all navigable waters within the legislative boundary of the Fire Island National Seashore, including the water column from the mean high-water line up to 4000 feet into Great South Bay, Narrows Bay, and Moriches Bay, and to 1000 feet into the Atlantic Ocean, from the eastern boundary of Robert Moses State Park to the western side of Moriches Inlet. New York State holds title to the Atlantic Ocean, including the seafloor, within the park boundary, but has granted full use and occupancy rights and ceded concurrent jurisdiction to NPS along the ocean for the entire length of the park boundary."	Potential water quality impacts within FIIS boundaries, Great South Bay, Narrows Bay, and Moriches Bay will be minimized or avoided through BMPs and mitigation plans (i.e., SPCC, HDD Work Plan, Inadvertent Return Plan, OSRP). Hazardous materials will not be transported via the barge except for material in any vehicles or equipment. The Onshore and Offshore SPCC plans describe the measures that will be taken to avoid or minimize any accidental releases, the material storage and handling procedures, as well as the procedures for responding to and remediating any accidental releases. The text mentioned in the 3rd bullet has been revised.
Benthic Resources Concerns DEIS at 3-82: Describe the cable corridor within the easement owned by the United States and administered by the NPS. DEIS at 3-84: Include a description of the characteristics of the benthic habitat within the United States easement area. If the description of the SRWEC-NYS area applies equally to the easement area, that should be expressly stated. DEIS at 3-99: This table should provide information on disturbance specifically within the easement owned by the United States and administered by the NPS. DEIS at 3-108: State expressly whether the increased DC EMF would	The cable corridor within the Fire Island National Seashore would be buried at a target depth of 5 to 75 ft (1.5 to 25 m) beneath the ground surface or channel bottom using an HDD and would be unlikely to affect the benthos. Text has been added to clarify the habitat characteristics within and outside of the Fire Island National Seashore boundary. In Section 3.7.5.1.1, the Final EIS describes where the seafloor disturbance would occur in relation to the Fire Island National Seashore boundary. The disturbance would be 2,225 ft offshore from MHWL, so it would be approximately 1,225 ft beyond the 1,000 ft easement. The COP (Sunrise Wind 2023b) states that an HDD exit

NPS Comment	Response
reach FIIS.	pit, which may be located offshore (approximately 2,225 ft [678 m] seaward from the MHWL) beyond the Fire Island National Seashore boundary, would disturb up to 61.8 ac (25 ha) of soft-bottom benthic habitat. The following was added to Section 3.7.5.1.1: "A small area of temporary disturbance (up to 4,800 sq ft (446 m^2)) would occur within the 1,000 ft (304.8 m) easement owned by the United States and administered by the NPS for the temporary landing structure (discussed below under temporary structures).: The following note was added to Table 3.7-4: The temporary landing structure construction impact area would fall within the Fire Island National Seashore boundary. Appendix J2 of the COP, *Onshore EMF Assessment*, covers the landfall and buried sections of cable that would pass under the FINS sea bottom. The following sentence from Appendix J2 has been added to Section 3.7.5.2.1: "EMF: The Onshore Transmission Cable, SRWEC–Transition, SRWEC at the TJB, and the Onshore Interconnection Cable would not be a direct source of any electric field above ground due to the cable construction, duct bank, and burial underground (COP Appendix J2, Exponent Engineering 2022)."
Threatened and Endangered Species Concerns The DEIS states, “To help minimize impacts, Sunrise Wind proposes an APM to complete construction activities to the extent possible in the off season of Smith Point County Park, which occurs from November 12 to March 31 annually; however, some construction activities may extend beyond that window (Suffolk County Parks 2018)” (DEIS at 3-628). FIIS manages Park resources to, among other things, protect piping plover, which is listed as threatened under the Endangered Species Act. Beach closures occur annually from March 15 through the end of	The Article VII Certificate issued by NYSPSC includes the following conditions specific to potential presence of piping plover. • **75.e.iii.** An area at least 1,000 meters 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 DPS Staff and NYSDEC. Further, any on-beach areas, as defined in Condition 75 (c),

NPS Comment	Response
August. The NPS requires more detailed information on construction activities to understand potential impacts to our ability to manage piping plovers on FIIS lands, and the potential impacts to the species from potential spills and spill response, including accident access, to noise, and night / late afternoon lighting impacts. The possible extension of construction activities beyond the dates listed above would not be supported by the NPS if they were to result in adverse impacts to the piping plover.	within that radius that are also within the Project Corridor will be posted by the Certificate Holder; • **75.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: ○ **75.f.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 DPS Staff 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 DPS Staff 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). This topic is addressed in the EM&CP, Section 4.7.1, submitted to the NYSPSC on 11/18/22: "The breeding habitats of red knot, roseate terns, piping plover and common terns do not occur in Project construction areas outside of Smith Point County Park. No on beach work (i.e., between the back dune and MLW) will occur between April 1 and August 31 to avoid impacts to RTE nesting shorebirds. From April 1 to August 31, while construction is occurring at the Landfall Laydown Area and ICW Laydown Areas, Sunrise Wind will immediately notify the NYSDEC if its

NPS Comment	Response
	Environmental Monitor observes nesting behaviors by any above-referenced nesting shorebirds within 500 ft (152.4 m) of the Landfall Laydown Area or ICW Laydown Areas. Due to the mobility and rarity of the listed bird species and construction timing and techniques, impacts to RTE bird species are expected to be minor to negligible." Additionally, information has been added to Section 3.8.5.1.1. The only activity that could occur on the beach is conduit stringing. This is described in the COP, Section 3.3.3.3. HDD conduit stringing may occur on Burma Road within Smith Point County Park, in an area located onshore south of the Smith Point County Park camping area. In addition, this topic is also addressed in the EM&CP, Appendix NN (HDD Work Plan), submitted to the NYSPSC on 3/27/23, and included as Attachment C of this submission: "The duct will be assembled on Burma Road within Smith Point County Park. Pipe rollers will be placed along Burma Road for support the conduit strings. The conduit will be maneuvered into the water using rollers and floated to the site by tugs for installation. When the duct sections are assembled, this action would require welding and short-term placement (i.e., 2–3 weeks per duct) of assembled HDD conduit sections. Approximately 3,500 ft (1,067 m) of duct sections will be laid out at the assembly site. Truck access will be restricted to the paved area and on Burma Road for delivery of the conduit. A fabrication area will be enclosed with temporary construction orange safety fencing and setup in a way to allow the conduit fusing equipment to be stationary during the fabrication process. As the fabrication process occurs tracked excavators will assist in pulling the conduit strings until each conduit string is fully fabricated. No improvements are planned for Burma Road as it meets the requirements for ingress and egress of the planned construction

NPS Comment	Response
	equipment and personnel. The duration of Burma Road activities is planned to take place for approximately 30 days from start of fabrication to removal, cleanup, and restoration of any impacted areas. HDD conduit stringing is anticipated to occur between February and March, in accordance with conditions of the [Article VII] Certificate." This information has been added to Chapter 2, Section 2.1.2.1.1.9.
DEIS at 1-9: The description of the NPS's involvement in the project at the top of page 1-9 of the DEIS is incomplete and missing analogous information included for the USACE and NOAA on page 1-8. Replace the paragraph regarding the NPS with the following: "The National Park Service (NPS) received an application from Sunrise Wind for Right-of-Way and Special Use permits at Fire Island National Seashore. This application was submitted for authorization to construct and install the transmission cable through lands within Fire Island National Seashore over which the United States holds an easement for the use and occupation for the purposes of Fire Island National Seashore, as well as conduct construction activity through NPS-administered waters. The NPS is evaluating Sunrise Wind's application pursuant to 54 U.S.C. § 100902, 36 C.F.R. Part 14, and 36 C.F.R. § 5.7. The NPS intends to review BOEM's Final EIS and, if the NPS determines that the Final EIS is sufficient to support the NPS's decision-making, to rely on the Final EIS to achieve the NPS's NEPA obligations."	This text was added.
DEIS at 2-41: The DEIS describes Bellport Bay and Bluepoint Marina/Corey Beach as being "within federally designated wilderness area." They are not. Revise that description to clarify that selection of either of those landfall sites would likely require that the transmission cable be placed through federally designated wilderness area, but that the alternative landfall sites themselves are not within the Wilderness Area.	This clarification was made.

NPS Comment	Response
DEIS at 3-619: The DEIS states that landfall at Bellport Bay or the Bluepoint Marina/Corey Beach "could have potential negative impacts to the federally designated Otis Pike Wilderness area." This statement is incomplete and does not differentiate the Bellport Bay and Bluepoint Marina/Corey Beach landfall sites from the Smith Point County Park landfall site. This statement should be revised to clarify that landfall at Bellport Bay or the Bluepoint Marina/Corey Beach would likely require that the transmission cable be placed through federally designated wilderness area.	Section 3.18.1 has been revised to clarify this statement.
DEIS at 3-619: The DEIS reports that "[a]ccess to the Landfall Work Area would be through Smith County Park and would not traverse … NPS managed portions of the Fire Island National Seashore." To the contrary, the project proposal contemplates use of a barge traversing NPS-managed waters in order to reach the Landfall Work Area. The EIS should be revised for accuracy.	The text in Section 3.18.1 has been revised.
DEIS at 3-689: National Wildlife Refuges are not part of the National Park System. Change references to the "9 national parks" to "9 national parks and wildlife refuges."	The text in Section 3.21.1 has been revised to state "nine national parks and wildlife refuges."
DEIS at 3-689 to 3-690: There is duplicative language regarding Suffolk County and FIIS that can be deleted.	The text in Section 3.21.1 has been revised to remove duplicative language.

O.4.1.5. Bureau of Safety and Environmental Enforcement

No comments were provided on the Sunrise Wind Draft EIS.

O.4.1.6. United State Fish and Wildlife Service

No comments were provided on the Sunrise Wind Draft EIS.

O.4.1.7. United State Army Corps of Engineers

No comments were provided on the Sunrise Wind Draft EIS.

O.4.2. Cooperating State Agencies

O.4.2.1. Massachusetts Office of Coastal Zone Management

Table O-6. Responses to Comments from Massachusetts Office of Coastal Zone Management [BOEM-2022-0071-0194]

MACZM Comment	Response
Of the project alternatives that BOEM has proposed, CZM recommends Alternative C2, which minimizes development impact on high-priority fisheries habitat. The WTG arrangement in Alternative C2 maximizes contiguous areas of complex bottom habitat that have been designated as high priority by the National Marine Fisheries Service. Avoiding development in areas of complex bottom and working to maximize the contiguous areas of complex bottom when such development is unavoidable, ensures intact habitat for commercially important species. Alternative C2 accomplishes this, without any reduction in the number of WTGs or eventual renewable power production.	Thank you for your comment, however based on new benthic data, Alternative C-2 is no longer feasible. Alternative C-3 has been proposed to minimize development in sensitive areas with the feasible WTG positions.
Appendix H outlines mitigation measures and monitoring protocols that Sunrise will employ to protect endangered species and other wildlife, maintain benthic resources including essential fish habitat, and ensure safe use of the wind lease area by vessels including commercial and recreational/for-hire fisheries. These measures should be codified as conditions in the final Record of Decision for the Sunrise project. Particularly important measures are highlighted below along with additional measures and clarifications requested by CZM.	Thank you for your comment, BOEM will take this into consideration.
The DEIS section 3.6.1 contains information on fisheries landings and revenue that will be exposed and includes breakdowns by species, gear, and port. This information is critical to avoid, mitigate, and minimize impacts on the commercial and for-hire fishing industry of Massachusetts and other states. The fisheries economic exposure	Thank you for your comment, please see Appendix H for mitigation measures.

MACZM Comment	Response
analysis in the FEIS should likewise include appropriate multipliers for the indirect and induced effects of lost fisheries revenue on the Massachusetts economy. These multipliers should be applied for both commercial and recreational/for-hire fisheries, and impacts should be broken down by port, gear, and species. Compensatory mitigation to offset potential economic losses should be codified in the ROD including timing, methodology, and oversight for the disbursement of funds.	
The FEIS should include a boulder relocation reporting plan to document and communicate the locations of moved or newly uncovered boulders to vessels that fish the area. Construction of monopile foundations and emplacement of the inter-array cables and the export cable will require extensive seafloor disturbance that will permanently alter the locations of boulder-related navigational hazards that are known to fishermen. Boulders pose a hazard for fishing vessels that may get hung up by their gear and relocating the boulders without effectively communicating their new locations compromises personal safety. This boulder reporting plan would complement the proposed Fisheries Communication plan.	Thank you for your comment, a Boulder Relocation Plan was developed which addresses your concerns. See Appendix H for more details.
CZM has reviewed the Sunrise Wind Fisheries and Benthic Research Monitoring Plan. The trawl surveys, acoustic telemetry studies of Atlantic cod and Highly Migratory Species, acoustic telemetry for evaluating electromagnetic frequency effects on elasmobranchs and horseshoe crabs, and soft and hard bottom benthic monitoring plans are rigorous and well-designed and should provide data to answer important questions about how the construction and operation of Sunrise might affect the distribution, abundance, and feeding of key species that currently exist within and adjacent to the project footprint. Sunrise should work with other research teams and with other developers to better understand and report on the anticipated	Thank you for your comment. The Monitoring Plan has been developed with input from federal and state agencies within the region. As described in the Fisheries and Benthic Research Monitoring Plan, annual reports and final reports at the end of each monitoring study will be provided to state and federal resource agencies. Final QA/QC'd data will be available upon request. Ørsted will continue to participate in the various regional working groups exploring standardized ways to store and provide access to benthic and fisheries monitoring data.

MACZM Comment	Response
regional effects upon fisheries species.	
The commitment by Sunrise to use noise attenuation systems (NAS) for all pile-driving and unexploded ordnance detonation activities is an especially important mitigation measure that will protect marine mammals, sea turtles, as well as other species. As construction plans are finalized, Sunrise should pursue the best available NAS, including single or double bubble curtains or other technologies to minimize impacts on sensitive marine species.	There is currently no standard or method determining what constitutes a best available sound attenuation system. BOEM believes the requirement to use a noise attenuation system is adequate to minimize potential impacts of sound exposure.
CZM reviewed an earlier draft of the DEIS as a cooperating agency to the NEPA process. A mitigation measure listed in that draft, Appendix H Table H-1, stating “No pile installation will occur from 01 January to 30 April.” has been removed from the current draft. This provision was specifically targeted at protecting endangered North Atlantic Right Whales. The FEIS should clarify whether this restriction is still in place, and if not, why it has been removed.	This measure was removed from Table H-1 because it was incorrectly identified as an APM. Time-of-year restrictions for marine mammals are defined in Table H-3, stating, 'No foundation impact pile-driving activities would occur January 1 through April 30." In addition, NMFS recommends a conservation recommendation from the Biological Assessment (Table H-2) to "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."
The FEIS should detail how Sunrise intends to monitor to minimize impacts from the entrainment of ichthyoplankton (eggs and larval organisms) in the DC converter station cooling system	Mitigation measures to reduce impacts to finfish and EFH from the converter station were included in the design of the facility. The OCS-DC was designed to have a through-screen velocity of 0.43 ft/s (0.13 m/s), which is below the threshold required for new facilities defined at §125.84(c) and is therefore protective against the impingement of juvenile and adult life stages of finfish. Accordingly, only the species with egg or larval life stages present in the vicinity of the OCS-DC would be susceptible to entrainment. The water depth of the intake pipe openings ~ 30 ft (10 m) above the seafloor was selected to minimize entrainment of ichthyoplankton and to take advantage of the cooler water temperatures found at depth to minimize water withdrawal volumes. The intake pipe will be equipped with a variable frequency drive (VFD). The VFD technology

MACZM Comment	Response
	allows the cooling water intake of the OCS-DC to be optimized as it relates to minimizing water withdrawals as power output and source water temperature varies temporally. Each intake pipe would have two coarse filters consisting of a Super-Duplex stainless steel vertical housing that encases a series of three banks of wedge wire filter tubes designed to filter suspended solids and organisms larger than 500 microns. The HZI is highly localized and does not extend within 15 ft (5 m) of the pre-installation seafloor grade or 98 ft (30 m) of the surface. Only eggs and larvae that enter the localized HZI would be susceptible to entrainment; species whose ichthyoplankton are buoyant or benthic would not be affected. "Based on recent conversations with the EPA, Sunrise Wind anticipates an NPDES Permit condition that will require monitoring of ichthyoplankton. Sunrise Wind will coordinate with the EPA to develop this Monitoring Plan. Monitoring would likely entail seasonal ichthyoplankton surveys, laboratory identification of eggs and larvae to lowest taxonomic level, and updated entrainment analysis."
The DEIS includes a calculation of equivalent adult losses expected from this unavoidable entrainment and characterizes the impact as minor. To ensure that losses are and remain minor through the operational lifetime of the project, a monitoring plan should be developed and described in the FEIS. This should include a description of regular operational procedures to inspect the cooling water intake system, its screens, and other entrainment prevention apparatus, and remediation measures that will be taken if intake velocity is found to be in excess of 0.5 fps or if impacts to target species are observed.	A Monitoring Plan is required for the NPDES Permit through the EPA. These details can be found in Table H-5 in Appendix H. At a minimum, biological monitoring must be conducted over a 48-hour period each quarter at two depth zones: within the estimated HZI of the cooling water intake system (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. The Permittee must conduct an ambient thermal monitoring program in accordance with the study design specified in Attachment A to the NPDES Permit. Ambient

MACZM Comment	Response
	thermal monitoring must be conducted during the 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.
The FEIS should include a detailed long-term monitoring and maintenance plan for inter- array and export cables to ensure all cables remain buried to the specified depth of 3-7 ft. Exposed and shallow cables are hazardous for all vessels that may drop anchor and are especially dangerous for fishing vessels that use gear that can become snagged on exposed cables. The monitoring plan should at a minimum detail the frequency and nature of cable inspections (e.g., annually plus after major storms) and the reporting requirements for these inspections. The maintenance plan should describe protocols for reburying the cable and preventing re-exposure, especially in areas of high seabed mobility such as sandy bottom. On-site inspections could be supplemented (but should not be replaced) with a distributed temperature sensing system, a cable alert system for vessels, and other measures to increase safety.	Thank you for the comment. All these concerns were considered and evaluated in the EIS, including alternatives that reduce the installation footprint in complex hard bottom habitats (see Alternative C). The feasibility of cable burial and secondary cable protection will be 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. The burial depth requirement would be evaluated and applied to any action alternative, and as a result, BOEM can develop and apply the appropriate mitigation measures. If adequate avoidance could not be achieved through mitigation, then BOEM could require an update to the COP that could require additional National Environmental Policy Act (NEPA) review. In September 2023, Sunrise Wind submitted an updated COP that states the target burial depth would be 4 to 6 ft (1.2 to 1.8 m).

O.4.2.2. Rhode Island Department of Environmental Management

Table O-7. Responses to Comments from Rhode Island Department of Environmental Management [BOEM-2022-0071-0244]

RIDEM Comment	Response
The geographic area analysis for the analysis does not include adjacent leases. Therefore, prospective effects the area of interest has on adjacent areas and vice versa are not considered. This notion follows a similar concern of not evaluating the cumulative effects of development on these areas.	Adjacent lease areas are evaluated as part of the cumulative impacts section. Adjacent lease areas are also evaluated for some resources when the GAA overlaps with the surrounding lease areas. The Cumulative Historic Resources Visual Effects Analysis (CHRVEA) considers the cumulative visual effects of Sunrise Wind and eight adjacent lease areas that are considered reasonably foreseeable for ongoing or future development.
As presented, it seems the 'No Action' Alternative assumes a scenario where this project does not move forward, but that all others would. This scenario seems unrealistic, and can distort one's interpretation of potential impacts from this project. As a result, such a scenario may imply that the impacts could be negligible, which would not be accurate.	The No Action Alternative uses existing offshore wind as the baseline and assumes this Project would not move forward. The cumulative action does, however, assume all projects would move forward to analyze the maximum impacts this area could experience.
Alternative C-2 will remove 8 WTG positions (identified in Alternative C-1), as well as a relocation of an additional 12 WTG positions from the Priority Areas of habitat identified by the National Marine Fisheries Service (NMFS). These WTGs will be relocated to the eastern side of the lease area, but ongoing geophysical and geotechnical surveys will help to determine whether the proposed WTG locations are feasible.	Thank you for your comment, these surveys have occurred and are discussed in the alternatives.
Of the alternatives presented, the RIDEM views Alternative C-2 as the most environmentally conservative alternative. The premise of Alternative C-2 is reasonable to minimize impacts to Atlantic cod (Gadus morhua) habitat. However, the Alternative as presented in Chapter 3 does not meet the premise as described in Chapter 2 (2.1.3.2). This is discussed further in comments specific to Chapter 3.	Thank you for your comment.

RIDEM Comment	Response
The determination that impacts of the proposed Alternatives C-1 and C-2, as currently presented, are negligible to minor may not be correct. If the Southern New England Atlantic cod biological stock's spawning is substantially impacted by the proposed action, this could result in stock-level population effects. The Atlantic Cod Stock Structure Working Group (ACSSWG) recently released their interdisciplinary review of Atlantic cod stock structure and determined that the Southern New England biological stock settlement has no plausible connectivity pathways originating from other stock areas. This suggests that Southern New England spawning results mainly in local settlement within the stock stratum and that impacts to local spawning activity could potentially have stock-level effects (McBride and Smedbol, 2022).	Due to glauconite sands, Alternative C-1 and C-2 are no longer feasible and will not be further evaluated. Alternative C-3 has been developed to address these feasibility issues with habitat minimization of Atlantic cod habitat in mind. Your comment was considered when analyzing impacts.
None of the alternatives present utilizing a smaller number of turbines to only meet the requirements of the 924 MW NYSERDA power purchase agreement and instead all focus on meeting the goal of 1,034 MW. While the "Purpose and Need" of the project is defined as what is requested in the Construction and Operations Plan, it remains unclear why this is the case, as there are no obligations for the developer to provide the additional MWs. If these additional MWs are required to make the Sunrise Wind project commercially viable, this should be stated explicitly and described as an alternative considered but not analyzed. Alternatively, if this is not the case, an alternative that avoids additional sensitive habitats by further reducing the number of WTGs should be analyzed in detail.	Alternative C3 has been developed and addresses this issue.
RIDEM suggestions for BOEM on requirements for the developer: • Work with the Rhode Island commercial and recreational fishing industries to minimize impacts to fishing activities and the biological resources on which they rely to the	Sunrise Wind is committed to collaborative science with the commercial and recreational fishing industries prior to and following construction. Please see Appendix H for additional mitigation measures and plans.

RIDEM Comment	Response
greatest extent possible and offer appropriate mitigation plans if adverse impacts cannot be avoided. • Mitigation plans should be developed with substantial input from the Rhode Island Fishermen's Advisory Board (FAB) and the CRMC.	
Conduct comprehensive fisheries resource monitoring surveys consistent with the recommendations outlined by the Responsible Offshore Science Alliance (ROSA): https://4d715fff-7bce-4957-b10baead478f74f6.filesusr.com/ugd/99421e_b8932042e6e140ee84c5f8531c2530ab.pdf. • These surveys should address concerns related to biological impacts associated with pile driving and operational noise, habitat loss and creation, sedimentation, electromagnetic fields, and cumulative impacts. • Surveys should include as many years as possible for data collection during pre, during, and post construction phases of the project to best characterize the environmental impacts.	Thank you for your comment. Sunrise Wind developed a Fisheries and Benthic Habitat Monitoring Plan (dated April 8, 2022) that has been prepared in accordance with recommendations set forth in BOEM's *Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to* 30 *CFR* Part 585 (BOEM 2019) and has committed to conducting preconstruction, during construction, and post-construction surveys and monitoring as part of the Proposed Action. The Monitoring Plan can be found at the following link: Proposed Action. The Monitoring Plan can be found at the following link: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/SRW01_COP_AppAA1_Fisheries%20and%20Benthic%20Monitoring%20Plan_2022-04-08_508.pdf. In addition to BOEM's guidance, the Fisheries and Benthic Monitoring Plan was developed using monitoring guidelines as part of the Rhode Island Coastal Resources Management Council's *Rhode Island Ocean Special Area Management Plan* (Ocean SAMP; RICRMC 2010). The Fishery Management Plan (FMP) was also developed through an iterative process, whereby survey protocols and methodologies were refined and updated based on feedback received from stakeholder groups. Stakeholder groups involved in this process included NOAA, NMFS, BOEM, Rhode Island Coastal Resources Management Council, Rhode Island Department of Environmental Management (Division of Marine Fisheries), Massachusetts Division of Marine Fisheries, Massachusetts Office of Coastal Zone Management, and

RIDEM Comment	Response
	representatives from the Responsible Offshore Science Alliance and the Responsible Offshore Development Alliance.
Conduct high resolution benthic habitat characterization and avoid areas of sensitive benthic habitats. These habitats provide refuge and structure for juvenile fish and invertebrates, as well as spawning areas for adult life history stages. • The NOAA Greater Atlantic Regional Fisheries Office has developed benthic habitat mapping recommendations to better inform Essential Fish Habitat consultations: https://media.fisheries.noaa.gov/2021-03/March292021_NMFS_Habitat_Mapping_Recommendations.pdf?null. These recommendations should be followed to ensure avoidance of sensitive habitats.	Sunrise Wind has conducted the recommended benthic habitat mapping and characterization survey to support COP development. This analysis was conducted consistent with NOAA 2021 guidance and was used to support the impact analysis presented in the Draft EIS and the Final EIS.
Minimize impacts to birds, sea turtles, and marine mammals, especially the critically endangered North Atlantic right whale (Eubalaena glacialis). • Southern New England has been identified as a significant foraging ground for right whales during their migrations. Significant measures have been taken to improve their population status via commercial lobster fishing restrictions. Additional commercial fishing measures are being evaluated by the Atlantic Large Whale Take Reduction Team, in addition to vessel speed requirement, to meet additional risk reduction targets. As such, the project should take the necessary actions to ensure it does not counteract these efforts. • Impact minimization could occur through, but is not limited to, construction time of year restrictions and exclusion zones, vessel speed restrictions (applied to all vessels	Sunrise Wind has committed to mitigation measures as proposed in the MMPA Letter of Authorization (LOA) Application and Protected Species Mitigation and Monitoring Plan (PSMMP) and included in Table H-1 of Appendix H of the Final EIS. Mitigation measures include, but are not limited to, vessel speed restrictions and noise mitigation measures. Please see Appendix H to review these measures.

RIDEM Comment	Response
associated with the wind farm), and noise mitigation measures. Sound scientific data collection and monitoring of the wind energy area is also essential to evaluating potential effects in real-time to enable implementation of adaptive management measures.	
The DEM is supportive of a 1 x 1 NM turbine grid layout to improve safety and fishing ability of the windfarm as best as possible.	Thank you for your comment.
The project includes one direct current (DC) export cable, at 3-7 ft. burial depth. Efforts should be made to avoid not achieving target burial depth to minimize impacts to fishing activities within the cable route. If a cable cannot be buried to 3 ft., or is located at a crossing with existing cables, and mattressing is installed, all cable mattress locations should be made available to the public and mattressing should be designed to limit the creation of new fishing 'hangs'.	Thank you for the comment. Alternatives that reduce the installation footprint in complex hard bottom habitats were considered (see Alternative C). The feasibility of cable burial and secondary cable protection will be 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. The burial depth requirement will be evaluated and applied to any action alternative, and BOEM will develop and apply any appropriate mitigation measures as a result. If adequate avoidance cannot not be achieved through mitigation, then BOEM can require an update to the COP that could require additional NEPA review. Additionally, please note Sunrise Wind submitted an updated COP in September 2023 that states the target burial depth would be 4 to 6 ft (1.2 to 1.8 m).
The cooling water intake system should be sited away from known areas of species spawning activity (e.g., Atlantic cod).	Moving the OCS-DC to another location is not technically or economically feasible, as it would necessitate a full redesign of the OCS-DC topside and jacket foundation and result in significant delays to the Project that are not compatible with meeting Sunrise Wind's purpose and need. The location of the OCS-DC was specifically selected as it is centrally located to balance the length of the export and collection infrastructure and account for the electrical constraints on the number of WTGs that can be connected to a single inter-array cable (IAC). Geotechnical surveys, including at each of the four legs of

RIDEM Comment	Response
	the OCS-DC piled jacket foundation and its center point, were completed in September/October 2020 in order to provide the required data for the detailed design of the OCS-DC foundation. Extensive G&G surveys have also been completed at WTG positions, IAC corridors, and the Sunrise Wind Export Cable (SRWEC). Relocation of the OCS-DC would require additional G&G surveys, and potentially benthic surveys, at a new OCS-DC location, as well as along the new IAC and SRWEC corridors. In summary, the time to plan, source, and complete surveys, ground modeling, Qualified Marine Archaeologist (QMA) analysis, potential unexploded ordinance/munition concern (pUXO/MEC) assessments, potential pUXO/MEC inspections, and updates to Project 2 reports, would have significant cost and schedule implications. There would also be a substantial knock-on effect in the design, engineering, fabrication, and installation of the OCS-DC, IAC, and SRWEC.
Construction and decommissioning of offshore wind farms may lead to loss of sediment and thus certain habitats. During any construction, local water turbidity may increase, as suspended solids and contaminants within the sediments may be mobilized and transported by prevailing water movements. • These mobilized sediments may also smother neighboring habitats of sessile species, as well as the living organisms themselves (Gill 2005).	Thank you for your comment, this information was incorporated into the Final EIS. A sediment transport modeling report completed for the SRWF is presented in Section 3.5.5.1.2 of *Water Quality*. Additionally, turbidity and suspended sediments are discussed in Section 3.7.5.1.2 of *Benthic Resources*
Suspended sediment poses a threat to fish within the construction area, as it may physically clog their gills and limit oxygen intake (Lake and Hinch 1999). Larval states are more vulnerable than adult life history stages due to more limited mobility, as well as larger gills and higher oxygen consumption in proportion to body size (Auld and Schubel 1978; Partridge and Michael 2010).	Agreed; this text has been included in the EIS.

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Sediment dispersal may also smother eggs and benthic suspension feeders by clogging the feeding or respiratory apparatus. Some benthic epifauna and deep burrowing infauna may also be unable to escape burial by displaced sediment. While sedimentation events are generally brief, seabed communities may be greatly altered and take years to recover (Maurer et al. 1986).	Thank you for your comment, this information is included in Sections 3.7.5 and 3.10.5. The *Benthic Impacts* section acknowledges that impacts would be moderate, and the description cites several studies that found soft bottom benthic communities recovered as quickly as 3 months, but noted that some studies found that recovery took 2 to 3 years (Kraus and Carter 2018; Brooks et al. 2006; BOEM 2015; Normandeau Associates 2014).
The RODEO study of the benthic habitat changes at the BIWF documented heavy colonization of the turbine structures by blue mussels three years post-construction, demonstrating changes in the dominant biota. Black sea bass were found in large numbers and appeared to benefit from added structure (Hutchison et al. 2020). • The study also found that the BIWF did not demonstrate the same strong vertical epifaunal zonation as observed on European farms. This may suggest that after three years, the habitat is still in a successional state and additional monitoring is needed to document the final successional stage (Hutchison et al. 2020). As such, longer benthic assessments should be conducted on projects moving forward.	Thank you for your comment. We reviewed the references and added information on blue mussels to the Final EIS. In Appendix AA1 of the COP, Fisheries and Benthic Monitoring Plan, Table 11 lists 5 years of monitoring for the novel hard bottom monitoring to include remotely operated vehicle (ROV)/ video data collection. This is longer than the 3 years noted by the comment. The Monitoring Plan describes the monitoring: the hard bottom monitoring will include an examination of three types of offshore wind (OSW) novel surfaces: WTG foundations (including scour protection layers), cable protection layers (SRWEC-OCS), and the converter station foundation (OCS-DC jacket). The primary objective of the novel hard bottom survey is to measure changes over time of the nature and extent of macrobiotic cover of hard bottom associated with OSW development. Macrofaunal percent cover, identification of key and dominant species, and the relative abundance of native and non-native organisms will be documented using a ROV and video surveying approach. Distinguishing non-native organisms will likely require physical sampling for accurate identification, which will be facilitated by a sampling arm attached to the ROV.
Soft sediments are generally preferred for wind farm development, as hard substrates may create challenges in turbine foundation and transmission cable installation. • Grabowski et al. (2014) suggest that soft sediment	The WTG sites were not chosen solely on the sediment size as noted by NMFS in the prioritization. Alternative C-3 avoids impacts to a substantial part of the Lease Area that contains contiguous soft bottom habitat.

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habitats have an inherent ability to recover more rapidly from anthropogenic impacts than other substrates. However, Henriques et al. (2014) contend that this is not appropriate logic to develop such areas due to the high number of affected species and possible consequences of impacts on those species for ecosystem structure and function (Grabowski et al. 2014; Henriques et al. 2014).	
Section 3.5.2.7 – Alternative C-2 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of 12 WTG Positions to the Eastern Side of the Lease Area: • As noted above, the intent of Alternative C-2 is sound. However, there appear to be inconsistencies between the alternative's goal and the method by which WTGs were relocated. The only metric that appears to have been used to identify the 20 WTGs to be moved is boulder density. While boulder density is indicative of complex benthic habitat, other metrics should be considered. For example, water depth plays a role and data on cod spawning activity in the area are available (refer to the Essential Fish Habitat Assessment for Sunrise Wind Offshore Wind Project, Figure 4-1). • Not including other metrics in this decision-making results in the alternatives not fully analyzing the potential impacts on cod larvae.	Alternative C-3 uses habitat, boulders, and Atlantic cod spawning data to determine WTG placement to reduce impacts on sensitive habitat for Atlantic cod. Due to the discovery of glauconite sands, Alternative C-1 and C-2 are no longer technically feasible. Recent Atlantic cod detection data was added to help develop Alternative C-3 which is discussed in Section 3.7.8.
Of species that are likely to be impacted from development in the Sunrise Wind lease area is Atlantic cod, which spawns in this area. Efforts should be made to avoid turbine placement, and construction in close proximity to any areas of complex benthic	Thank you for your comment. To address these issues, Atlantic cod is considered in Alternative C-3. Additionally, pile driving would not be permitted during a portion of the Atlantic cod spawning time frame, which will hopefully reduce impacts. BOEM is in consultation with

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habitat in general in an effort to best maintain current complex habitat structures that species such as Atlantic cod rely on. Atlantic cod have supported significant recreational and commercial fisheries that are important to coastal communities, especially in Rhode Island (Serchuk and Wigley 1992; Oviatt et al., 2003). Climate change is anticipated to hinder Atlantic cod stock rebuilding, but recreational angler accounts suggest that abundance of cod south of Rhode Island has increased significantly over the past 15 years (Sheriff 2018). Cox Ledge may be very important for effective stock rebuilding given the unique habitat of the area and potential significance in spawning. Early life history stages of Atlantic cod need complex benthic habitats, specifically boulder, cobble, and pebble substrates (NOAA 1999). Moreover, cod exhibit site fidelity (Zemeckis et al. 2017) and spawning aggregations are sensitive to disturbance (Dean et al. 2012). Langan et al. (2019) suggest that eggs and larvae spawned near Cox Ledge may settle in Narragansett Bay based on larval cod observations in the Bay and their estimated hatching dates.	NMFS to best reduce impacts to Atlantic cod with these concerns in mind.
The full spatial and temporal extent of Southern New England Atlantic cod spawning is poorly understood, as many long-term scientific surveys do not provide the spatial and temporal resolution needed to properly characterize the distribution of cod spawning activity (DeCelles et al. 2017). However, recently it has been suggested that the Southern New England cod stock has major self-connectivity, meaning that spawning activity in the stratum is the primary source of settlement within that stratum. As such, all available data to date should be used to best understand the spawning dynamics of the species and inform impact risks.	Thank you for your comment. We are using the most up-to-date data available, including data from the recent BOEM-funded studies on Atlantic cod in this area, to help inform the decision-making process.

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Despite long-term spatially resolved information, the presence of spawning aggregations of cod in southern New England waters has been documented through various sources (Zemeckis et al. 2014). Cod have historically been managed as two units: the Gulf of Maine and the Georges Bank management units (McBride and Smedbol 2020), both of which are currently in depleted states (NEFSC 2017a, NEFSC 2017b). Although managed as two broad stocks, the management units are believed to have finer scale structure within that support metapopulations. This metapopulation structure is likely critical in supporting the overall stock. Such metapopulation and heterogeneity characteristics are important to identify, as mismatches between management units and stock structure can reduce the effectiveness of management measures. Further, the connectivity between stocks and metapopulations is important to account for to better understand a stock's resiliency to various natural and fishing mortality pressures. For example, it has been suggested that cod spawning components in the Great South Cannel, Nantucket Shoals, southern New England and the MidAtlantic are more connected (genetically and in terms of larval dispersal) with spawning components in the Gulf of Maine than those on eastern Georges Bank, the unit with which they are currently managed with (Zemeckis et al. 2014).	Thank you for your comment. This information has influenced the development of Alternatives C-1, C-2, and C-3 to reduce impacts to the Atlantic cod population.
The ACSSWG supports the finer scale biological stock structure scenarios, and identified a series of mismatches: 1) phenotypic and genetic heterogeneity suggesting that cod are not mixed within management units, 2) extensive movements between management units, and 3) dispersal of larvae around Cape Cod from the Gulf of Maine unit to the Georges Bank unit (McBride and Smedbol 2020). The ACSSWG concluded that there are likely more than two stocks of Atlantic cod, highlighting the need for improved science on a fine	Thank you for your comment. This information has influenced the development of Alternatives C-1, C-2, and C-3 to reduce impacts to the Atlantic cod population.

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scale spatial structure for this species, particularly in areas that seem to sustain cod	
Of these newly proposed management units, a separate southern New England (SNE) stock (represented as NOAA Statistical Areas 537, 538 and 539) is included. Spawning is known to occur within the area between late fall/early winter (Nov-Jan) and late winter/early spring (Feb-Apr), which some suggest represents a single metapopulation unique to this area. • The DEIS does not discuss potential time of year restrictions for construction or potential seasonal mitigation measures for the cooling water intake system (discussed more below) for Atlantic cod spawning. The time of year that certain construction (e.g., pile driving) and operation activities (e.g., cooling water intake) occur may substantially impact spawning activities for this species. The Southern New England strata have ample habitat available (meaning depth and temperature preference) at the time of year when winter-spawned larvae become capable of settlement (McBride and Smedbol, 2022), indicating that disruptions to spawning during the Nov-Jan or Feb-Apr periods could limit the amount of habitat available at the time of larval sediment.	Thank you for your comment. The EIS has been revised to be consistent with revisions to the EFH Assessment document, including environmental protection measures (EPMs)/mitigation measures.
Currently, the Atlantic Cod Research Track Stock Assessment Working Group is looking to implement the recommendations from the ACSSWG by constructing empirical or analytical stock assessment models for cod. This could result in a separate biologically managed stock for SNE. If Cox Ledge and wind energy areas are significant in supporting a SNE cod stock, development could then have dire impacts on the stock itself and have substantive impacts for fisheries management at this finer scale.	Thank you for your comment. This information has influenced the development of Alternatives C-1, C-2, and C-3 to reduce impacts to the Atlantic cod population.

RIDEM Comment	Response
The construction phase is the most likely to have negative effects on fish and habitat. Of primary concern is construction noise generated by pile driving operations. High sound levels can cause hearing loss (threshold shifts), elicit stress, and alter behavior of fish. Impacts will vary by species, as well as sound exposure (Popper et al. 2003). • For Atlantic cod, noise of frequencies from 100-1000 hertz has been found to reduce reproductive output (Sierra-Flores et al. 2015). • Operational phase noise is not likely to cause permanent damage, but it may mask communication in some fish species (Wahlberg and Westerberg 2005). This remains one of the least studied areas of wind farm noise impacts (Mooney et al. 2020). • In the context of anthropogenic noise, it is important to consider invertebrates separately from vertebrates; invertebrates (e.g., mollusks) hear in a different manner than vertebrates due to their nervous system structure and hearing organs. Their hearing organs, statocysts, work by detecting particle motion instead of sound pressure (Stocker 2002). o There may be negative impacts near the project, as de Soto et al. (2013) suggest that even routine anthropogenic noise can decrease recruitment of scallop larvae in wild stocks (Madsen et al. 2006). o Jones et al. (2020) determined that longfin squid exhibited a startle response to pile driving noise in a lab setting but they habituated quickly in the short term. 24 hours later, the squid were re-sensitized to the noise.	Thank you for your comment, more information about noise effects on aquatic organisms is included in the Final EIS, please see Sections 3.10.3 and 3.10.5.

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The operational phase of the project will present additional challenges in the form of the cooling water intake system and electromagnetic fields from the submerged cables. Most previous studies on electromagnetic fields have focused on direct current (DC) cables. DC and AC cables should not be considered comparable when determining impacts, as fish may perceive static and alternating magnetic fields differently (Rommel and McCleave 1973a). This project has both a DC transmission cable and AC interarray cables, which should be analyzed independently. • Various elasmobranchs (e.g. smooth dogfish and blue sharks) and teleost fish (sea lamprey, American eels, and Atlantic salmon) are all thought to be able to sense electric fields at low levels (Heyer et al. 1981; Kalmijn 1982; Rommel and McCleave 1973b). However, it is presently unknown whether behavioral changes will result from detected AC electromagnetic fields. Behavioral responses of American lobster and little skates have been documented in response to DC electromagnetic fields emitted by two high-voltage DC cables: increased foraging/exploratory behavior in skates, and a subtler exploratory response in lobsters (Hutchison et al. 2018; Hutchison et al. 2020).	Both alternating current (AC) and direct current (DC) cable impacts are analyzed within the Final EIS. Additional analysis of the potential effects of the cooling water system was added to the Final EIS in Section 3.11, *Marine Mammals*. For potential EMF impacts, the primary justification for negligible impacts is that the area where magnetic fields is potentially detectable is very small, and unlikely to be detectable at the surface of the substrate in areas where cable is buried. EMF will only extend a couple of feet above the substrate in areas where the cable is at the surface of the substrate or under rock armoring.
The impacts of induced electromagnetic fields are expected to be greater for cartilaginous fish because they use electromagnetic signals to detect their prey (Bailey et al. 2014; Gill 2005; Gill and Kimber 2005; Bergstrom et al. 2014).	This text was included in the Final EIS in Section 3.10.5.2.2.
Other fish may also be affected by interference with their capacity to orient in relation to the geomagnetic field, potentially disturbing fish migration patterns (Metcalf et al. 2015) and ultimately	This text was included in the Final EIS in Section 3.10.5.2.2.

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disturbing their habitat.	
The developer has considered a variety of offshore fishing data sources: vessel trip reports (VTRs), vessel monitoring systems, and Marine Recreational Information Program data. Each data source has merits and limitations, as none of these data reporting systems were designed to assess the spatial distribution and value of offshore catch. A variety of studies are currently underway to generate additional data sharing systems and assessment tools. • Other sources of data and improved methods should be incorporated into impact assessment as they become available. For example, vessel monitoring system (VMS), automatic identification system (AIS), and electronic monitoring data are becoming more prevalent and may present opportunities to improve upon existing methods. These data may offer higher spatial and temporal resolutions, and address challenges associated with self-reporting, when compared to VTRs. • Additional methods are particularly needed to understand potential changes to recreational fishing activities.	Both vessel monitoring system (VMS) and automatic identification system (AIS) data were used within various components of the development of the Sunrise Wind COP and have been presented within the EIS. Sunrise Wind included a Navigation Risk and Safety Assessment (NRSA) as part of their COP that utilized AIS and VMS, as well as other data, to evaluate the impact of the proposed SRWF on navigation. VMS data and figures are presented within Section 3.6.1 to provide context for the different vessels transiting the Lease Area or actively fishing the Lease Area. Although the VMS data is more related to commercial fishing, the EIS utilized the Marine Recreational Information Program (MRIP) data that is discussed within the Sunrise Wind COP to understand for-hire recreational fishing.
The development may offer benefits to certain fish and invertebrate species through structure creation (i.e., artificial reefs). The turbine foundations may thus increase hard substrate for recruitment following any disturbance during the construction phase (Petersen and Malm 2006). The reef effect can increase food availability (Degraer et al. 2020) and biodiversity and biomass (Inger et al. 2009; Gill 2005; Linley et al. 2007). However, new habitat created by the turbine foundations may not benefit all species that utilized the local habitat prior to construction, and may serve to attract biomass as	Text regarding the artificial reef can be found in Section 3.10.5.2.2. Text was also added to this section to discuss how this change in habitat may not serve all species that utilized the habitat prior to construction. A Fisheries and Benthic Monitoring Plan (Appendix AA1 in the COP) will be implemented following approval of the Project.

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opposed to result in increased ecosystem productivity. As such, it is important that these elements be evaluated as possible throughout the project to best understand the long-term effects of the region.	

O.4.2.3. New York State Agencies

The following comments are from the New York State Department of State (NYSDOS), Department of Environmental Conservation (NYSDEC), and the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP), in coordination with the Department of Public Service (NYSDPS), (collectively, the NYS Agencies).

Table O-8. Responses to Comments from New York State Agencies [BOEM-2022-0071-0245]

New York State Agency Comment	Response
There are multiple sub-alternatives that identify a range of turbine position removal and relocation scenarios within three (3) priority areas. The Agencies urge BOEM to analyze physical and ecological data, including recently conducted telemetry and geotechnical studies within the lease area, the potential for unintended consequences as a result of shifting turbine positions, and appropriate minimization and mitigation measures for each of the sub-alternatives before selecting the Preferred Alternative.	Thank you for your comment. We have received the recent Atlantic cod data and used it in the analysis for Alternative C-3, along with benthic data. Due to the discovery of glauconite sands, Alternative C-1 and C-2 are no longer technically feasible.
Level of Impacts: The Agencies urge that BOEM refine its impact level definitions system to afford greater weight for impact avoidance within the "Beneficial Impact Levels" category. The benefits of avoidance should be identified as either Moderate or Major so that these attributes can be appropriately considered when analyzing the Proposed Action and Alternatives. For example, alternatives that preserve spawning habitats and reduce in-water disturbance would also have less of an effect on commercial fishing.	The Final EIS uses a four-level classification scheme to characterize the potential impacts of the alternatives, discussed in Section 3.1. Resource-specific impact level definitions are presented in each resource section, and the impacts of each alternative align with the appropriate impact level, as supported by the analysis. EIS alternatives reduced impacts to some resources; however, did not always result in a change to the resource's impact level conclusion. The minimization of impacts is identified and quantified where possible in the Final EIS.
The Agencies continue to recommend a minimum target cable burial depth of 6ft for all projects, where technically feasible. This burial depth is consistent with BOEM's Draft Fisheries Mitigation Guidance and typically provides sufficient protection to both the cable and	EIS Section 3.3 defines the terminology used throughout the EIS to characterize the duration of impacts as short-term (effects that may extend up to 3 years), long-term (effects that may extend between 3 years and 35 years or the life of the Project), or permanent (effects

New York State Agency Comment	Response
maritime users in the area. This depth reduces the risk of fishing gear interactions and mitigates the effects of electromagnetic fields (EMF) on sensitive species that inhabit and transit through the Project Area.	that extend beyond the life of the Project).
The Agencies continue to urge greater transparency and additional details on the Cable Burial Risk Assessment (CBRA) process and the anticipated need for deeper burial depths to minimize risks to commercial vessels operating and transiting within the Project area. Refer to the Kitty Hawk Offshore Wind Project COP Appendix J as a template for how to provide a qualitative CBRA during the COP phase. As a mitigation measure, developers should conduct stakeholder outreach on design changes to the anticipated burial depth based on information from the draft CBRA. The final CBRA should be accompanied by a comment-response matrix demonstrating that comments on the draft CBRA have been addressed and incorporated to the extent applicable before submitting to BOEM for approval.	Thank you for your comment.
Impacts from the OCS-DC/CWIS located in the Project lease area should be analyzed in greater detail and at a finer scale.	Thank you for your comment, additional details on the OCS-DC/CWIS have been added to the Final EIS, see Section 3.10.5.
Essential Fish Habitat (EFH) for eggs and/or larvae have been designated for 29 individual species of fish and invertebrates within the lease area (COP Appendix N1; Sunrise Wind 2022). The potential for adverse environmental impacts from a CWIS relates to entrainment and subsequent mortality of egg and larval stages of fish and invertebrates within the cooling system and thermal stress on all life stages from the discharge of heated effluent. Estimates of total anticipated mortality across all species should be provided, including invertebrates which are not currently analyzed in the COP. The analysis should also articulate the potential impacts to vulnerable species with low or declining stocks.	Entrainment is discussed in Section 3.10.5.2. Additional information can be found in the NMFS's *Essential Fish Habitat Assessment for the Sunrise Wind Offshore Wind Project* (EFH Assessment) and Appendix B. To evaluate the potential entrainment during operational OCS-DC withdrawals, species abundance data was obtained from the NOAA National Centers for Environmental Information (NCEI) electronic database. This database include data collected by NOAA's Marine Resource Monitoring, Assessment, and Prediction (MARMAP) program from 1977-1987 and by the Ecosystem Monitoring (EcoMon) program from 1995 through 2017 throughout the North Atlantic region. These data only include larval ichthyoplankton, as fish eggs are not identified to species. There is no abundance information available for invertebrates to calculate potential

New York State Agency Comment	Response
	entrainment or calculate of equivalent adults.
Installation of the CWIS within an area of high cod spawning activity increases the likelihood of long-term adverse impacts on early life stages and the viability of the species. Accordingly, impacts of siting the CWIS within Priority Area 1 on cod spawning activity and survival should be analyzed in greater detail. Furthermore, assessment of CWIS impacts on communities that rely on hard bottom habitat found in other priority areas should also be considered.	Section 3.10.5.2.2, *Offshore Activities and Facilities Entrainment,* contains a write up of mitigation measures designed to mitigate entrainment.
The Agencies acknowledge that BOEM was unable to analyze the use of closed-cycle cooling for the OCS-DC due to technological limitations. BOEM should consider adding the following new mitigation measures to reduce impingement mortality and entrainment of egg and larval stages. The Agencies are available to discuss and further refine these concepts with BOEM. i.Upgrade/retrofit the CWIS to a closed-cycle cooling system if the technology becomes available during Project operations. ii.Reduce the CWIS through-screen velocity below 0.5 feet/second, which is the threshold required for new facilities defined at 40 CFR §125.84(c). For example, Sunrise Wind models a velocity of 0.43 ft/s scenario, but it is unclear if this is the lowest feasible velocity (COP Appendix N1; Sunrise Wind 2022). iii. Reduce the CWIS water withdrawal, when feasible, during periods of peak egg and larval abundance within the area affected by the OCS-DC.	Table H-3 of Appendix H has been updated to include these mitigation measures.
Throughout the DEIS, BOEM uses the 100-year time horizon global warming potentials (GWP100) values; however, 20-year time horizon potentials (GWP20) values are cited for New York in Table 3.4.1-1. The Agencies recommend that GWP100 totals in the cited report be used, as it is currently misleading and presents New York as having high	Table 3.4-2 (previously Table 3.4.1-1) in the Final EIS was updated to reflect the 100-year time horizon global warming potential (GWP100) total for New York.

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emissions rates.	
Sulfur hexafluoride (SF6) emissions are discussed as a greenhouse gas (GHG); however, there is no SF6 emissions estimates. The Agencies recommend that SF6 emissions estimates be included in the DEIS.	Sulfur hexafluoride (SF6) emissions are included in Sections 3.4.5.2.1 and 3.4.5.2.2 in the Final EIS (previously Sections 3.4.1.5.2.1 and 3.4.1.5.2.2 in the Draft EIS).
Throughout the discussion of GHG emissions in the DEIS, de minimis arguments are used that the Council on Environmental Quality recommends against in their guidance regarding climate change in National Environmental Policy Act (NEPA) reviews. The Agencies recommend that BOEM use the best available estimates for the Project emissions and apply the social cost, or SC-GHG, to each individual GHG.	An analysis of the social cost of greenhouse gas (SC-GHG) was included in Section 3.4.5.5.
The text discussing GHG emissions from onshore construction activities would be clearer if it expressly discussed New York emissions of carbon dioxide equivalent (CO2e), since a significant portion of onshore construction activities for the Project will take place in New York State. Specifically, we recommend revising Section 3.4.1.5.1.1 at pg. 3-17 as follows: “Climate change: GHG emissions would occur throughout the onshore construction phase; however, they would be small compared to total annual statewide emissions. CO2e emissions were estimated to range from 1,074 tpy (974.3 metric tpy) for emissions within 3 nm (3.45 mi; 5.6 km) of Connecticut to 32,893 tpy (2,9840.028 metric tpy) for emissions within 3 nm (3.45 mi; 5.6 km) of New York, to 73,202 tpy (66,407.7 metric tpy) for emissions within 3 nm (3.45 mi; 5.6 km) of Maryland (COP Appendix K, Sunrise Wind 2022).”	The text in Section 3.4.5.1.1 of the Final EIS was revised (previously Section 3.4.1.5.1.1 in the Draft EIS).
Bats (Section 3.5.1): This section states that “The Project would reduce the potential impacts to bats by conducting tree clearing during winter months to the extent practicable”. The Agencies recommend that this text be revised to reference the specific time period because March	Text in Section 3.6.5.1.1 has been revised as recommended. This edit was also made in the Section 3.8.5.1.1., under *Birds*.

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should not be included. The NYSDEC "no tree clearing" window in Suffolk County occurs from March 1 – November 30.	
Section 3.5.2.3, Impacts of Alternative A – No Action on Benthic Resources, evaluates the potential impact of EMF on benthic communities, which could differ between high voltage alternating current (HVAC) and high voltage direct current (HVDC). The second paragraph of the EMF section states that, "EMF effects from these future projects on benthic habitats, EFH, invertebrates, and finfish would vary in extent and significance depending on... project-specific transmission design (e.g., HVAC or HVDC, transmission voltage)" and "EMF effects from future activities would be negligible; however, (Hutchison 2018; Hutchison 2020b) have observed behavioral responses in lobster that were exposed to an EMF from an HVDC cable in a controlled environment, meaning that higher level (e.g., minor or moderate) effects could result should future projects use HVDC transmission." Given this information, the Agencies suggest impacts from EMF should be evaluated assuming HVDC technology as it may have higher level effects than HVAC on benthic resources. Additionally, multiple states, including New York, are beginning to require the use of HVDC technology, and therefore it is reasonable to assume HVDC will continue to be used for future projects.	Updated information was added to Section 3.7.3.1, under *Benthic Resources*.
Section 3.5.2.5 Impacts of Alternative B – Proposed Action on Benthic Resources notes that information from an EMF synthesis paper "concludes that while some studies have shown changes in individuals during laboratory studies, not enough information is available to determine how those changes may extend to the population or community level or ecological processes", but then proceeds to state that "population-level effects on key invertebrate species are not expected and impacts are expected to remain negligible". It is important to recognize that further in-situ, species-specific research is	Information was added from the Harsanyi et al. 2022 paper and the impacts have been updated to minor to moderate, depending on AC versus DC cables.

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needed in order to fully assess and understand EMF impacts on finfish, benthic communities, and marine protected species. Accordingly, the Agencies urge BOEM to take a more cautious approach when considering EMF and not rule out the possibility of unforeseen higher level effects.	
Birds (Section 3.5.3): Section 3.5.3.1.4 states that "… no bald eagle nests have been recorded" near onshore Projects components. The Agencies request this be corrected; bald eagles have been documented in the vicinity. There is a known bald eagle nest within 1.5 miles of onshore Project components in the Wertheim National Wildlife Refuge.	Thank you for your comment. The text has been revised as recommended.
Coastal Habitat and Fauna (Section 3.5.4): Verify if any facility improvements may be needed to support operations and maintenance (O&M). Dredging, shoreline improvements, and new docks or piers that may be needed for the O&M facility should be analyzed in this impact category.	Text has been added to revise/expand the description of the temporary landing structure in Sections 3.9.4 and 3.9.5 of the EIS. A temporary pile-supported trestle will be used to transfer construction equipment and materials to minimize the environmental impact to the extent practicable and provide the safest platform for the transfer of the construction equipment, materials, and activity of the crew.
Finfish, Invertebrates, and Essential Fish Habitat (Section 3.5.5): The DEIS states that" Sunrise Wind assumes up to 10 percent of the total [inter-array cable] IAC network would require boulder clearance and up to 5 percent of the total IAC network would require sand wave leveling prior to installation of the cables". The Agencies recommend adding a "Cable emplacement and maintenance" category to further analyze the potential impacts of sand wave leveling on finfish, invertebrates, and EFH. Particular emphasis should be given to potential impacts on squid spawning habitat and the need for scour protection and/or cable protection in these areas that would prevent sand waves from reforming, thereby representing a long-term habitat impact.	Potential impacts are discussed in Section 3.10.5.1.2, under *Finfish, Invertebrates, and Essential Fish Habitat*.

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Geographic analysis area (Section 3.6.1): The Agencies recommend that the range of states included in the commercial and for-hire fishing analysis be reduced to reflect the states with active commercial fishing in the Project. New York State has routinely commented that the range used to evaluate the average revenue and landings is too broad to evaluate a specific fishing area and leads to a diluted assessment of the overall effect on fisheries and fishing industries that may be affected by the Project. For comparison, BOEM analyzed a well-defined and appropriate Regional Fisheries Area in the Revolution Wind DEIS (see Revolution Wind DEIS, Figure 3.9- 2). Establishing that a project-specific Regional Fisheries Area should be the standard for all offshore wind environmental reviews. Fishermen operating off New York should be afforded a similar detailed analysis as those operating off Rhode Island and Massachusetts.	The GAA utilized in Section 3.6.1 for commercial fisheries and for-hire recreational fishing was established to capture a comprehensive view of all waters and states the Proposed Action may impact. Several species that may be present in the vicinity of the Lease Area are migratory and may move throughout the GAA over the course of the year. In addition, vessels may travel from ports and states throughout the GAA to fish the areas in and around the Lease Area. The Draft EIS provided revenue exposure by FMP Fishery to establish how these fisheries may be impacted and the associated impacts on commercial and for-hire recreational operations. Additional tables have been provided in the Final EIS that capture revenue exposure by port and state. Providing these additional tables further captures the impacts and allows for the identification of the areas that the Proposed Action may most impact.
For clarity, the impacts to commercial and for-hire recreational fisheries should be stated separately. That is, the FEIS should state specifically what the impacts to commercial fisheries would be and what the impacts to recreational for-hire fisheries would be for each of the alternatives. For example, the DEIS currently states that, “BOEM expects that the impacts resulting from the Proposed Action would be [sic] range from minor to major, depending on the fishery and fishing operation, with the overall impact on commercial fisheries and for-hire recreational fishing being moderate.” See also DEIS Table 3.6.1-23. As is, it is not clear whether the impacts to each of the commercial and for-hire recreational fisheries are expected to be “moderate,” or whether this is an aggregate or overall level of impact. For comparison, BOEM analyzed the potential impacts to these fisheries industries separately in the Empire Wind DEIS.5	The Comparison of Alternatives table (Table 3.14-24 of the Final EIS) has been updated to show impacts to commercial fisheries and for-hire recreational fishing separately for clarity.

New York State Agency Comment	Response
Relatedly, there is a discrepancy in the description of the Proposed Action's impacts on commercial fisheries that should be resolved. In Section 3.6.1.5.5 of the DEIS it states: "BOEM expects that the impacts resulting from the Proposed Action would be [sic] range from minor to major, depending on the fishery and fishing operation, with the overall impact on commercial fisheries and for-hire recreational fishing being moderate." However, in Section 3.6.1.9 on "Proposed Mitigation," the DEIS states: "These measures, if adopted, would have the effect of reducing the overall moderate to major impact of the Proposed Action on commercial fisheries to minor to moderate." The DEIS should clarify whether the impacts to commercial fisheries are moderate or moderate to major. Addressing the previous comment may bring the needed clarification.	The conclusion statements within Section 3.14 of the Final EIS have been updated to be consistent and clear throughout the section.
Furthermore, the analysis of potential impacts of the Project on fishing industries should include: i. A quantitative analysis of fisheries economic exposure along the export cable corridors and shoreside industries (e.g., processors, fuel suppliers, distributors). The Agencies suggest relying on the RIDEM 2017 analysis for the export cable corridors in federal waters. Revolution Wind, Vineyard Wind, and South Fork Wind included quantitative exposure analyses of the wind farm area, cable corridors, and shoreside industries, which set a precedent of analyzing the entire project area and full scope of potential upstream and downstream effects. BOEM's draft fisheries mitigation guidance articulates the importance of developing accurate revenue exposure estimates in order to evaluate the potential for income losses to fishing industries and demonstrate the need for compensation. While neither the COP nor the DEIS currently provide baseline valuations for the export cable corridor or shoreside industries, calculated multipliers, such as those developed by NMFS as part of fisheries disaster situations, can be a	Due to the fact that the cable corridor impacts are temporary in nature during the construction period, BOEM has determined that a qualitative discussion is appropriate. In addition, the importance of the commercial fishing industry to shoreside services and industries is acknowledged as there are a variety of ports and shoreside businesses within this area. To that end, the analysis includes an extensive analysis of commercial fishing revenue exposure within the Lease Area. For the Final EIS, two additional tables have been included to outline and present revenue exposure by both port and state to better articulate the potential impacts related to the Proposed Action.

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useful proxy in the absence of direct economic information from industry participants. The Agencies recommend NYSDEC and NYSDOS be included in further coordination with BOEM on the specific multiplier that may be selected for this Project. Omitting the cable corridors and shoreside industries from this analysis would undervalue the revenue exposure estimate and is a departure from BOEM's past EISs.	
The analysis of potential impacts of the Project on fishing industries should include: ii. Careful consideration of methods to adjust for inflation over time and address regional and fishery-specific variation in shoreside industries. For example, a 2020 report by Murray et al provided estimates of value added for summer flounder that suggest a multiplier of 12X, and a 2020 study from Scheld9 reported a multiplier for longfin squid of 7.64X.	Historic revenue by FMP fishery and species have been adjusted for inflation. Revenue exposure estimates for the Proposed Action, including two new tables that present revenue exposure for the Lease Area specific to ports and states, are presented in nominal dollars.
The analysis of potential impacts of the Project on fishing industries should include: iii. Compensation for gear loss and damage that extends through operations and beyond if Project infrastructure is not fully removed.	Ørsted has a corporate policy and procedure that would be implemented to compensate commercial and for-hire recreational fishing entities for gear loss as it relates to Project activities. This applicant-proposed mitigation measure (APM) was added to the text within Final EIS Section 3.14 and is noted in Appendix H (Table H-1) as APM CFHFISH-06. Compensation for gear loss is also noted under "Other Agency-proposed Mitigation Measures" in Table H-3 as proposed by BOEM and Bureau of Safety and Environmental Enforcement (BSEE).
The analysis of potential impacts of the Project on fishing industries should include: iv. A compensation value that is inclusive, fair, and equitable so that demonstrated impacts can be offset regardless of where fishermen land their catch or where shoreside businesses are located.	The revenue exposure analysis provided in Section 3.14 for the Proposed Action is comprehensive and conservative in nature. It provides an estimate of overall revenue exposure by FMP, as well as new tables within Section 3.14 that provide a breakdown by port and state. This provides an understanding of what areas and

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	communities may be most impacted by the Proposed Action with respect to the fishing industry.
The analysis of potential impacts of the Project on fishing industries should include: v. A Record of Decision that emphasizes the need for a compensatory mitigation claims process that is transparent, data-driven, and uncoupled from states' Coastal Zone Management Act (CZMA) reviews and, in so doing, provides compensation for demonstrated impacts to communities and businesses in a fair and equitable manner.	BOEM has proposed a mitigation measure for fisheries compensation, to include commercial and for-hire recreational fishing operations and their associated shoreside services. BOEM intends to make it a condition of COP approval.
Environmental Justice (EJ) (Section 3.6.4): This section misstates the criteria New York State uses to define an EJ community, but correctly applies those criteria in the subsequent analysis. The first paragraph of Section 3.6.4.1.1 should be amended as follows: New York identifies an EJ community, as a Potential EJ Areas (PEJA) which are U.S. Census block groups that meet one of more of the following criteria (NYSDEC 2022): (1) at least 52.42 percent of the population in an urban area reported themselves to be members of minority groups, (2) at least 26.28 percent of the population in a rural area reported themselves to be members of minority groups, and (3) at least 22.82 percent of the population in an urban or rural area has household incomes below the federal poverty level.	The text within Section 3.17.1.1 (previously Section 3.6.4) was updated to correctly outline New York State's definition of an environmental justice community.
NYSDOS and NYSDEC are mentioned as BOEM's anticipated enforcing agencies related to conditions in the Article VII Order. This includes Measure Number/Name: WQ-04, EN-20, GEN-21, and GEN-25, but there may be other instances. The Agencies request that NYSDOS and NYSDEC be removed as they are not the appropriate enforcing agencies. Instead, the NYS Public Service Commission should be	Appendix H has been revised to name the New York State (NYS) Public Service Commission as the enforcing agency for these mitigation measures instead of New York State Department of State (NYSDOS) and New York State Department of Environmental Conservation (NYSDEC).

New York State Agency Comment	Response
named as the enforcing agency for these mitigation measures.	
The Agencies recommend developing and implementing a comprehensive Mariner Communication and Outreach Plan that covers all project phases from pre-construction to decommissioning. There is a proposed fisheries communication and outreach plan (See ID CFHFISH-02) and a communication plan (see GEN-14), and these should 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 fisheries plan. A shallow-buried cable of 3ft depth presents an increased risk to ocean users because it would occupy heavily trafficked routes and traditional fishing grounds for squid, surfclam/ocean quahog, and scallop. Additionally, if periodic cable exposures occur, New York shipping and fishing industries could be directly affected by the increased risk of interactions, displacement during maintenance and remedial burial activities, and increased vessel traffic and noise during maintenance. NYSDOS recommends the following as components of an effective mariner communication plan to ensure existing uses are accommodated to the maximum extent possible:	Appendix H has been revised to include a mitigation measure for a Mariner Communication Plan.
(cont.) i. Pre-COP consultation with potentially affected stakeholders on initial routing and results of the draft Navigation Safety Risk Assessment;	This has been added to Appendix H under the Mariner Communication Plan.
(cont.) ii. During Project design, coordinating in-water construction activities to avoid and minimize disruptions;	This has been added to Appendix H under the Mariner Communication Plan.
(cont.) 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	This has been added to Appendix H under the Mariner Communication Plan.

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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;	
(cont.) iv. Following COP approval, notice of proposed changes which have the potential to impact fishing or maritime resources or activities;	This has been added to Appendix H under the Mariner Communication Plan.
(cont.) v. Notices to commence construction activities, conduct maintenance activities, and commence decommissioning;	This has been added to Appendix H under the Mariner Communication Plan.
(cont.) vi. Status reports during construction with specific information on construction activities and locations for upcoming activities in the next 1-2 weeks;	This has been added to Appendix H under the Mariner Communication Plan.
(cont.) 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.	This mitigation has been added to Appendix H, additionally BOEM addresses these concerns as terms and conditions to the approval of the Construction and Operations Plan.
The Agencies recommend new mitigation measures be incorporated to address impacts to long-standing ocean uses of importance to New York. The following are suggested measures consistent with the Empire Wind DEIS: i. 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 §§ 585.832 and 585.833. reports will be filed annually during construction and decommissioning, and every 5 years during operations.	Thank you for your comment, BOEM will take this into consideration.

New York State Agency Comment	Response
(cont.) ii. Sunrise Wind's Cable Installation Plan or Cable Burial Risk Assessment will: 1. Depict precise planned locations and burial depths of the entire cable system; 2. Detail how cable installation and operation will be managed to ensure disruption to maritime uses is minimized along the cable route; and 3. evaluate the need for additional mitigation measures, including deeper burial depth to mitigate risks to ocean users, including crossing existing and proposed Traffic Lanes and Fairways	A copy of the Cable Burial Plan shall be submitted by Sunrise Wind as part of their Facility Design Report (FDR)/Fabrication and Installation Report (FIR) that depict precise locations and burial depths of the entire cable system. The plan shall be reviewed by United States Coast Guard (USCG) and BOEM.
(cont.) iii. Sunrise Wind will establish an adaptation fund to equip vessel operators with necessary safety training and equipment, including suitable marine vessel radar, where appropriate.	Requiring the establishment of such a fund is not consistent with BOEM policy, and therefore is not included in the EIS.
Section 3.4.2.1.1: Carmans River is incorrectly spelled as "Carmens River".	The spelling of Carmans River in Section 3.5.1.1 was corrected.
Section 3.5.1.4, pg. 3-67: New York State Department of Environmental Conservation (NYSDEC) is incorrectly spelled as "New York State Department of Economic Conservation (NYSDEC)".	Spell out was removed as the acronym was defined earlier in the text.
Section 3.5.1.5.1.1, pg 3-67: NYSDEC is incorrectly spelled as "NWDEC"	Text in Section 3.6.5.1.1. has been revised as recommended.
On pg. 3-79, the Agencies request that "Sound" in the following sentence be deleted as there is no overlap with the Long Island Sound. "The SRWF and the SRWEC would cross waters that transition from the continental slope and coastal areas near Long Island Sound extending out onto the OCS."	This has been corrected.

O.4.2.4. Rhode Island Coastal Resources Management Council

No comments were provided on the Sunrise Wind Draft EIS.

O.5. Responses to Lessee Comments on the Draft EIS

Table O-9. Responses to Comments from Sunrise Wind LLC [BOEM-2022-0071-0226]

Lessee Comment	Response
In the introduction (DEIS Section 1.3, page 1-10), the DEIS states: "The analyses in this Draft EIS will inform BOEM's decision under 30 CFR 585.628 for the COP that was initially submitted in September 2020 and later updated with current information on June 7, 2021, October 29, 2021, and April 8, 2022." Sunrise Wind notes that this submission history does not include the December 18, 2020, the August 23, 2021, or the most recent August 19, 2022, versions of the COP. We provide below a few key examples where use of outdated COP versions in the DEIS have led to inaccurate PDE details. Appendix A to this letter provides other noted instances of this discrepancy occurring in the DEIS.	The statement has been corrected, and the Final EIS has been updated to reflect the information in the August 2022 COP as well as the updates from the September 2023 COP.
Several figures in the DEIS and supporting appendices are not based on the most recent, August 2022, version of the COP, and thus do not align with the current PDE. For example, Figure 2.1.2-3 (DEIS page 2-11), although produced in October 2022, shows an Onshore Interconnection Cable Route, Onshore Transmission Cable Route, Landfall horizontal directional drill (HDD), and Sunrise Wind Export Cable (SRWEC) that are all outdated and do not reflect current Project design (see for comparison, COP Figure 1.1-2).	Figures 2.1-1 and 2.1-3 in the Final EIS (previously Figures 2.1.2-1 and 2.1.2-3 in the Draft EIS) have been revised to reflect the information in the August 2022 COP and September 2023 COP.
Some of the PDE details presented in various tables and text also do not reflect current parameters. For example, Table ES-1 (page ES-v) and Section 3.6.9.5.2.2 (page 3-745) identify the total structure height of the Offshore Converter Station (OCS–DC) as up to 361 ft (110.0 m). The current Project design is up to 295 ft (90 m) (see COP Table 1.2-1).	The structure height of the OCS-DC has been corrected throughout the Final EIS.

Lessee Comment	Response
Many of the textual descriptions stem from earlier COP submissions and therefore do not reflect narrowing of PDE assumptions, such as the reduction from two to one Landfall HDD in New York State waters (DEIS pages 3-96 and 3-99); revision to Temporary Landing Structure language (see examples on DEIS pages 3-183, 3-185, and 3-218 versus COP Section 3.3.10-2); or revision to the write-up concerning munitions and explosives of concern/unexploded ordinances (MEC/UXO) clearance activities (DEIS page 3-282 versus COP Section 3-37 and COP Appendix I4), which is not cited in the DEIS.	The Landfall HDD, temporary landing structure language, and UXO language was updated to reflect the information in the August 2022 COP.
Several of the characterizations of information are also not based on the most recent Project details and assessments. For example, the discussion of electromagnetic fields (EMF) on DEIS pages 3-299 and 3-300 cites Appendix J (Sunrise Wind 2021j) and uses results from that version; however, this appendix, along with several others, was updated and resubmitted with the August 2022 version of the COP. For example, COP Appendices J1, J2, M1, M2, M3, P1, V, X all have 2022 versions but are cited throughout the DEIS to their earlier 2020 or 2021 versions.	Thank you for your comment. The Final EIS has been updated.
The DEIS's Executive Summary does not include the U.S. Environmental Protection Agency (EPA) as a cooperating agency. The EPA is a cooperating agency for the Project that will rely on the DEIS to support its decision on Sunrise Wind's application for a National Pollutant Discharge Elimination System (NPDES) individual permit for a new facility and should be included in the discussion. Similarly, the EPA NPDES permit should be described in Sections 1.2 and 2.1 in the FEIS.	The *Executive Summary*, Section 1.2, and Section 2.1 of the EIS have been updated to include USEPA as cooperating agency.
The DEIS contains language on page 2-27 concerning ongoing UXO surveys; at the time of the DEIS publication, Sunrise Wind had completed its UXO surveys. Of the potential MECs surveyed, only one was confirmed as a UXO. The As Low and Reasonably Practicable (ALARP) Certificate Report is due in early 2023. Sunrise Wind respectfully requests that some of the language that trends UXO ambiguity and incomplete surveys be	Thank you for your comment. Section 2.1.2.1.2.6 has been updated with the As Low as Reasonably Practicable (ALARP) results.

Lessee Comment	Response
removed and be replaced in the FEIS with language that indicates that surveys were completed with one UXO finding. In addition, results from the ALARP Certificate Report will be available and should be included in the FEIS. We think that these facts will further influence how potential UXO mitigations may be viewed in the FEIS.	
In the DEIS, BOEM provides anticipated impact determinations of the Project on Endangered Species Act (ESA)-listed species that could be present in the Project Area. Such determinations are a component of the informal consultation process pursuant to Section 7(a)(2) of the ESA and typically only included in Biological Assessments (BA) for the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), consistent with the approach taken for the Empire Wind, Revolution Wind, Ocean Wind 1, and South Fork Wind Projects. The inclusion of these determinations in the BA is typically accompanied by detailed justification for the determinations, including discussion of potential impact producing factors (IPF) on listed species. For example, to help inform determinations for listed bird species, BOEM generally follows the parameterization of the Band Model5 to evaluate the risk of bird collision with operating wind turbine generators (WTG) in offshore wind farms and provides the results of the model in the BA as supporting evidence for the determinations. In the DEIS, BOEM cites only the inclusion of supporting information in the relevant taxa sections to support the expected determinations for listed species. For these reasons, Sunrise Wind believes that the inclusion of any reference to listed species impact determinations in the DEIS, even if just indicated as 'anticipated,' causes confusion, lacks precedent and is unnecessary when such determinations are included in the USFWS and NMFS BAs. We respectfully request that BOEM removes the sections pertaining to anticipated impacts to ESA-listed species in the Sunrise Wind FEIS	The language was updated to remove the determinations.

Lessee Comment	Response
In addition, the IPF / significance criteria for bats provided in the Sunrise Wind DEIS and the South Fork Wind FEIS are similarly defined (Sunrise Wind DEIS Table G-5, page G-6 and South Fork Wind FEIS Table 3.4.1-1, page H-35). However, the South Fork Wind FEIS concludes, and the USFWS concurred (March 2021) that the South Fork Wind Project may affect, but is not likely to adversely affect, the northern long-eared bat (NLEB), whereas the Sunrise Wind DEIS (Section 3.5.1.5.4) states that the Proposed Action would likely adversely affect but not jeopardize the continued existence of NLEB. Based on the similar impact assessment between Sunrise Wind and South Fork Wind for impacts to bats, and similar proposed mitigation measures for NLEBs, Sunrise Wind believes the same conclusion should be made for the Proposed Action. Furthermore, Sunrise Wind completed bat acoustic surveys in areas of the Proposed Action requiring clearing in Summer 2022, and no NLEBs were detected during the surveys. The acoustic bat survey report was provided to the USFWS on October 26, 2022, and to BOEM on October 27, 2022.	The Biological Assessment provided a thorough analysis of potential impacts to northern long-eared bats and concluded that the Project may affect but is not likely to adversely affect this species. The determination in the Final EIS will be updated to match the Not Likely to Adversely Affect (NLAA) determination.
Text throughout the DEIS describes Alternative C-2 as excluding the 8 WTG positions identified in Alternative C-1 from development and removing an additional 12 WTG positions from the Priority Areas and relocating them to the eastern side of the Lease Area. This description should be revised in the FEIS to indicate that up to 8 WTG positions would be excluded and up to 12 WTG positions would be removed and relocated to align with the language used to describe Alternative C-1 (i.e., “exclusion of up to 8 WTG positions from development…”) and to allow flexibility to utilize the maximum number of turbines in the Project’s PDE.	We added "up to" for the number of WTGs considered for Alt C-2.
Sunrise Wind is supportive of a preferred alternative identified in the FEIS that maintains flexibility to use the maximum amount of turbine locations that are anticipated to be technically feasible to install, that meets the Project’s purpose and need, and that also minimizes impacts to benthic habitat and resources. Based on additional review of geophysical and	Alternative C-3 has been developed to address the possibility of technical infeasibility of these positions.

Lessee Comment	Response
geotechnical (G&G) data throughout the Lease Area and in particular the presence of glauconite sands, Sunrise Wind anticipates foundation installation may result in pile refusal at several of the 102 proposed WTG positions in the PDE, as well as at several of the 12 positions along the eastern portion of the Lease Area identified in Alternative C-2. Sunrise Wind continues to evaluate the results of completed G&G surveys and plans on proposing an alternative layout that is aligned with the objectives of DEIS Alternatives C-1 and C-2 while minimizing the risk of pile refusal. This alternative layout would minimize benthic habitat impacts to the largest extent practicable, within the technical limitations of foundation installation.	
In Section 3.5.2.1.2, the DEIS states: "Benthic sediment mapping classified areas as glacial moraine and till based on morphological interpretation of an irregular seafloor (COP, Appendix M3; Sunrise Wind, 2021)." The use of the term 'glacial moraine' here is not accurate. As described in Appendix M3: "The Sunrise Wind Farm (SRWF) and SRWEC–OCS are located immediately south of submerged end moraines, in what was an extensive glacial outwash plain. Glacial moraine habitats were not observed within the Study Area. The glacial deposits found at SRWF are termed Glacial Drift and are stratified deposited of glacial sediments that have been re-worked and sorted by the movement of water. These glacial deposits are not considered to be surface expressions of unstratified moraine deposits associated with submerged glacial moraine complexes (Sunrise Wind LLC 2021b). However, Glacial Drift provides a similar benthic habitat for invertebrates and demersal fish as do unconsolidated glacial moraine habitats found to the north of the SRWF." Sunrise Wind respectfully requests this sentence be revised in the FEIS to indicate that glacial drift, and not glacial moraine, was classified in the Project Area.	The term "glacial moraine" was revised to "glacial drift" and defined as stratified and sorted materials.

Lessee Comment	Response
Several locations in the DEIS (pages 3-82, 3-87, 3-96) state that "eelgrass was found along the south shore of the channel" when discussing site-specific survey results. Eelgrass was not found in this location during the 2020 benthic survey conducted at eight stations in the Intracoastal Waterway (ICW) or during the submerged aquatic vegetation (SAV)-focused surveys conducted in Summer 2020 and Fall 2022 with towed video. While SAV was mapped along the south shore by the New York Department of State's 2018 LISS Estuary Habitat data set, eelgrass was not found in the more recent aforementioned surveys. SAV bed distribution frequently changes from year to year, particularly when large beds are not established, and water quality and clarity are highly variable. Sunrise Wind is committed to avoiding impacts to SAV and would avoid and minimize impacts to this sensitive habitat to the extent practicable. Sunrise Wind asks that text stating that eelgrass was found along the south shore of the channel during Sunrise Wind's field surveys be excluded from the FEIS.	The Final EIS characterized the eelgrass as potentially occurring in the Project Area, and noted that it was found in 2018, but has not been confirmed in a more recent survey (2022). Sunrise Wind has described pre-Project surveys for the area that would confirm its presence prior to surface disturbance.
Sunrise Wind provided maximum acres of potential permanent and temporary disturbance for each Project component (foundations, scour protection, cable protection, seafloor clearance, etc.) in the COP Appendix M3 - Benthic Habitat Mapping to Support EFH Consultation. Table 3.5.2-3 on page 3-96 of the DEIS presents acres of potential disturbance for Project component areas divided by short- and long-term disturbance types. However, no information is provided as to which components were combined and tallied for each disturbance type and, although some values are close to those presented in Appendix M3, potentially important discrepancies remain. Sunrise Wind respectfully requests information on the methodology used by BOEM to calculate the values provided in this table. Sunrise Wind welcomes discussion and offers support in providing disturbance calculations developed in a consistent manner as needed.	Table 3.7-4 has been replaced with a compilation of Table 4-1 from the August 2022 Appendix M-3. It uses the same breakdown for short-term (temporary) and long-term (permanent) as Appendix M-3.

Lessee Comment	Response
Page 3-175 of the DEIS states: "Coastal habitats associated with the landfall/ICW work areas on Fire Island include maritime beaches, dunes, and grasslands. Coastal habitats in the landfall/ICW work area on the mainland include beach and dune communities located along the south side of the mainland and associated interdunal areas." This text should be expanded upon in the FEIS to provide clarification that the Landfall/ICW Work Areas on Fire Island would be largely confined to the existing, paved Smith Point County Park parking lot, Burma Road, and maintained recreational fields located west of William Floyd Parkway. The ICW Work Areas on the mainland would be confined to the paved parking lot associated with Smith Point Marina and paved portions of East Concourse Road. No portion of the ICW or Landfall HDD Work Areas would impact vegetation on maritime beaches, dunes, or grasslands.	The following text has been added to Section 3.9.1.10 of the EIS, "Landfall/ICW Work Areas on Fire Island would be largely confined to the existing, paved Smith Point County Park parking lot, Burma Road, and maintained recreational fields located west of William Floyd Parkway, with the exception of cable stringing on the beach." The added text follows the paragraph beginning with "The Landfall/ICW Work Area on the mainland is primarily developed....". Section 3.9.1.9 of the Final EIS recognizes the high use of the proposed HDD stringing area and the unlikely presence of rare, threatened, and endangered (RTE) plants and presence/absence of protected species, which will be confirmed prior to construction activities. The potential impacts referenced are documented in COP Appendix L, summarized in Final EIS Tables 3.9-1 and -2, and described in the draft United States Fish and Wildlife Service (USFWS) Biological Assessment and NMFS EFH Assessment. The COP (Section 4.4.4.1) states "Additionally, HDD conduit stringing may occur on Burma Road within Smith Point County Park; this action would require welding and short-term placement (i.e., 2–3 weeks per duct) of assembled HDD conduit sections in approximately 3,500 ft (1,067 m) of coastal habitats (including Maritime Beach) before the duct is maneuvered offshore and installed via HDD." In addition, COP Appendix L, Figure 3, Sheet 16 of 16 , and COP Figure 3.3.3-3 indicate undeveloped areas in line with or directly proximate to proposed construction areas. Figure 3.3.3-3 of the COP shows pipe stringing area along dune edges. Appendix B of Appendix L in the COP (Stantec 2022), indicates that maritime beach habitats are intercepted by the Project and that "all proposed cable routes would intercept maritime beach, a rare

Lessee Comment	Response
	and significant coastal community." Also described in Section 3.9.1.9, listed plant species (seabeach amaranth and sandplain gerardia) are not present within a mile of planned activities for HDD/stringing activities, although the presence of vegetation is not precluded. The statement, "No portion of the ICW or Landfall HDD Work Areas would impact vegetation on maritime beaches, dunes, or grasslands" is not supported by the COP or Appendix L.
Page 3-186 of the DEIS states: "Because HDD conduit stringing on the beach would result in the loss of any vegetation it intercepts, there is potential for disturbance of seabeach amaranth if it is present." Conduit stringing would occur on Burma Road within Smith Point County Park. Sunrise Wind feels it should be clarified in the FEIS that (as noted in COP Section 4.4.1.1), the beach area where the HDD conduit stringing is proposed consists of an unvegetated sand beach that is well-used by pedestrians, and portions are open to vehicular traffic. Vegetated sand dunes would not be affected by the HDD conduit stringing activities. Further, seabeach amaranth was not observed during field surveys, and suitable habitat was not identified in the Landfall Work Area.	Pipe stringing is not included in the designated work area; it parallels the shoreline in maritime beach habitat. It is recognized that the area is well traveled and RTE species are unlikely. However, species surveys will be completed prior to construction activities to confirm presence/absence of vegetation in general and RTE species. The COP (section 4.4.4.1) states, "Additionally, HDD conduit stringing may occur on Burma Road within Smith Point County Park; this action would require welding and short-term placement (i.e., 2–3 weeks per duct) of assembled HDD conduit sections in approximately 3,500 ft (1,067 m) of coastal habitats (including Maritime Beach) before the duct is maneuvered offshore and installed via HDD." If this is inaccurate, this response should be revisited.
Page 3-186 also states: "Along most of the transmission route, localized adverse impacts to habitats would occur due to trenching, vegetation removal, soil compaction, surface water runoff or pooling, and potential inadvertent burial of vegetation and fauna during construction ROW and locations where the transmission cable installation changes between trenching and HDD." As noted in the DEIS, less than 1 percent of the onshore route is located outside of existing disturbed rights-of-way, and most of the onshore transmission facilities would be installed below paved locations associated with parking lots and roadways. As a result, Sunrise Wind feels this statement is inaccurate as it relates to onshore	We proposed the sentence, "Along most of the transmission route..." be followed with clarification such as, "However, less than 1 percent of the onshore route is outside existing rights-of-way (ROWs), as described in Section 3.9.5.1.1. Impacts to these areas are deemed negligible but are included to ensure all potential impact-producing factors (IPFs) are addressed."

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construction impacts and should not be included in the FEIS.	
Page 3-187 of the DEIS states: "Presence of structures relevant to coastal habitats and fauna include onshore transmission cables and associated facilities along the proposed transmission route; the presence of these structures is expected to convert existing habitats to hard-top and/or impervious surfaces for cable protection and facilities such as the converter station (cable installation is addressed above). The OnCS-DC would be constructed in a compatible area of industrial or commercial land use and would therefore have negligible impacts on coastal habitats and fauna." No portion of the Onshore Transmission Cable or Onshore Interconnection Cable would result in the conversion of existing vegetated habitats to hard-top or impervious cover types. The OnCS-DC has been sited in a location that contains minimal vegetation and is dominated by existing pavement and various buildings. As a result, Project-wide, there would be a trivial net increase in impervious cover and/or conversion of vegetated habitats; therefore, Sunrise Wind feels these details should not be included in the FEIS.	The potential impacts referenced are documented in COP Appendix L, summarized in Draft EIS Tables 3.5.4-1 and -2, and described in the draft USFWS Biological Assessment and NMFS EFH Assessment. COP Appendix L, Figure 3, Sheet 16 of 16, and COP Figure 3.3.3-3 indicate undeveloped areas in line with or directly proximate to proposed construction areas. COP Table 3.3.2-5 identifies potential impacts to greenways along the onshore transmission corridor as well. Impacts to these areas are deemed negligible but are included to ensure all potential IPFs are addressed. No changes have been made.
Page 3-187 also states: “traffic from onshore vehicles may impact coastal habitats and fauna due to physical disturbance, traffic detours to more sensitive alternative routes, including at Smith Point County Park beach access locations, resulting in disturbance of maritime dune and grassland habitats and could impact the federally threatened seabeach amaranth.” This section also notes traffic delays may cause travelers to detour through sensitive areas such as the Wertheim National Wildlife Refuge (NWR) where coastal habitats and vegetation would be disturbed by increased traffic noise, debris from road and vehicles, and potential collisions with wildlife or off-road detours that damage vegetation. Sunrise Wind believes it is unlikely that Project activities would have any measurable impact on traffic patterns within sensitive areas such as Smith Point County Park or the Wertheim NWR. Sunrise Wind has implemented	The EIS states, "The OnCS-DC would be constructed in a compatible area of industrial or commercial land use and would therefore have negligible (i.e., not measurable, parentheses added) impacts on coastal habitats and fauna." However, there will be temporary and potential impacts due to construction, as documented in COP Appendix L, summarized in Draft EIS Tables 3.5.4-1 and -2, and the USFWS Biological and NMFS EFH Assessments, which describe 2.3 acres of tree removal for the facility (also in Sections 3.6 and 3.8, *Bats* and *Birds*). Regarding traffic: in the absence of traffic studies to document the amount of traffic present with and without the Project construction, potential impacts described are considered relevant. Therefore, there are no data to support "no" rather than "negligible" effect,

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avoidance and minimization measures, including: • time of year restrictions for work at Smith Point County Park and Smith Point Marina to avoid rare, threatened, and endangered species and avoid the summer tourist season; • the use of agency-approved Maintenance and Protection of Traffic Plans; • the commitment to maintain vehicular and pedestrian access at existing travel ways; and • coordinating Project construction schedules with the applicable roadway and management authorities to minimize work during periods of high-traffic volumes to the extent feasible.	and no changes to the EIS are needed.
Project and public access would be maintained and confined to lawfully developed roads and access ways; therefore, no new disturbance of maritime dune, beach, or grassland habitats would occur due to Project construction on Fire Island. Additionally, any temporary increase of vehicle traffic through the Wertheim NWR would be limited to travel along Montauk Highway (New York County Route 80), a paved roadway that spans the majority of Long Island, New York and is already subject to significant traffic volumes. Furthermore, due to the north/south orientation of Carmans River and associated wetlands, there are no additional opportunities for east to west vehicle travel near the Project Area. As a result, Sunrise Wind believes this assessment of traffic impacts should be revised in the FEIS to reflect the Project details provided herein.	COP Appendix L documents potential impacts to maritime dune, beach, or grassland habitats, also summarized in Tables 3.9-1 and 3.9-2 (previously Tables 3.5.4-1 and 3.5.4-2 of the Draft EIS). Tree removal and other construction-related disturbance would occur during installation at Carmans River (COP Section 3.3.2.3). These potential impacts are included to ensure all potential IPFs are addressed. Primary IPFs relevant to coastal habitats and fauna in the GAA are listed in Table G-8 of Appendix G. Impacts to these areas (with respect to developed roads and access ways) are deemed negligible and additional information regarding potential impacts would not reduce the impact level of the proposed activities reported in the Draft EIS. No changes made.
Additionally, page 3-183 of the DEIS provides an overview of potential impacts to SAV and benthic habitats from installation of the Temporary Landing Structure. This section should be updated in the FEIS to reflect the current modified design of the Temporary Landing Structure, the duration the structure would be installed, and the results of the Fall 2022 SAV-	Sections 3.9.4 and 3.9.5 have been revised to reflect new information, including the selection of a pile-supported trestle for the transfer of the construction equipment and materials that would minimize the environmental impact to the extent practicable and provide the safest platform for the transfer of

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focused surveys, which found no significant eelgrass populations in the location selected for the Temporary Landing Structure.	the construction equipment/materials and activity of the crew. The section will also include information from the draft EFH Assessment (December 2022), which was updated with October 2022 SAV surveys using underwater video and a global positioning system (GPS)-enabled Seaviewer drop camera along east-west and north-south transect lines in the proposed temporary landing site, where no significant populations of eelgrass were found (see EFH Assessment for details).
Page 3-196 of the DEIS states that "SRWF overlaps Cox Ledge." However, the Sunrise Wind Farm does not overlap with, but is instead proximal to, Cox Ledge. This should be corrected in the FEIS. The location of Cox Ledge is accurately portrayed in Figure 2.1.3-1 of the DEIS.	Figure 2.1-6 depicts the distance of the SRWF from Cox Ledge based on available data. The full extent of where Cox Ledge extends to is not clear. Language describing the distance between the SRWF and Cox Ledge and/or the statement "adjacent to" has been added to Section 2.1.3, Section 3.7.1.1, and Sections 3.10.1, 3.10.5, 3.10.6, and 3.10.7.
The species listed as expected to occur in the SRWF and SRWEC in Section 3.5.6.1 and Table 3.5.6-1 do not align with those included in the COP and Incidental Take Application (ITA). It is important that the FEIS evaluate potential impacts to the same species as the ITA so that NMFS can use the EIS to comply with NEPA in issuing the Letter of Authorization. For example, the DEIS does not include the blue whale as likely to occur within the Project Area. However, the COP indicates that the blue whale may occur within the Project Area. COP Appendix O1 states: "...due to their endangered status and because they have been detected in the SRWF area during acoustic surveys, blue whales were included in the acoustic assessment", which aligns with the ITA.	Blue whales have been added for consistency with the determinations made in NOAA's proposed LOA under the MMPA. Please note that the acoustic surveys the COP refers to detected blue whales but did not confirm that the whales were actually in the SRWF Project Area. The researchers of this study indicate that no blue whales were seen during the visual surveys and the far detection range of a blue whale vocalization (more than 200 km [124.3 mi]) suggest that the vocalizing blue whales were likely outside of the study area (Kraus et al. 2016).
Additionally, the DEIS lists the short-finned pilot whale as a species likely to occur within the Project Area. Both the COP and ITA characterize this species as having a 'rare' occurrence within the Project Area due to its distribution.6 There is no additional data suggesting this species would have a likely occurrence within the Project Area. Therefore, it should not	The inclusion of both short-finned and long-finned pilot whales is consistent with the Incidental Take Authorization (ITA), which includes "pilot whales" and estimates take for this group. Sightings often cannot be confidently identified to the species level and are typically recorded as "pilot whales." BOEM includes

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be included as a potentially affected species. Finally, Sunrise Wind would like to point out a discrepancy between the DEIS and the ITA regarding Risso's dolphin. The original ITA (May 2022) published on the NMFS website mistakenly excluded Risso's dolphin. However, after subsequent discussions with NMFS, Risso's dolphin was added to the ITA when the Updated Density and Take Estimates Memo (December 2022) was submitted to NMFS and is part of the Draft ITAs proposed by NMFS.7 Sunrise Wind agrees with Risso's dolphin being included in the FEIS. NMFS intends to include this species within the Proposed Rule for consistency with the FEIS.	short-finned and long-finned pilot whales as potentially occurring in the Project Area based on the following information: uncertainty of the exact ranges of these species, potential for range shifts due to climate change, difficulty distinguishing between these species in the field, recent sightings of short-finned pilot whales in the nearby New York Bight, and tagged short-finned pilot whales detected as far north as Nantucket Shoals and Georges Bank (see Thorne et al. 2017; NYSERDA 2020; Payne and Heinemann 1993; Rone et al. 2012). NMFS's 2021 stock assessment for short- and long-finned pilot whales lists three stranding in Massachusetts and references Pugliares et al. (2016) for another stranding. Both blue whales and pilot whales are generally observed off the shelf break or further offshore. Both species are characterized as rare within the Project Area. We find the approach of excluding short-finned pilot whales is inconsistent with the approach requested by NMFS for blue whales.
Section 3.5.6.5.2.2 of the DEIS categorizes non-impulsive sound produced by WTGs as having a 'minor to long-term' effect on marine mammals. However, the language justifying this designation does not specifically describe the low-frequency (LF) sound produced by WTG operations and the resulting potential impact on LF cetaceans as a hearing group. Sunrise Wind agrees that any potential impacts to LF cetaceans would be minor. However, we believe it is important also to note that the impact would be localized, as the sounds would only be received in certain areas around each WTG foundation. Because the animals are continually moving, they would only be within the area of potential impact for a brief period of time.	The analysis already describes WTG operating noise as low intensity and highly localized. We removed "and long term" from the impact level determination in Section 3.11.5.2, as the duration of the sound is already considered in the analysis.

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Sunrise Wind provided an Updated Marine Mammal Density and Take Estimates Memo in December 2022 (December 2022 Memo) and requests that applicable DEIS text be updated in the FEIS with these more current data. For example, the December 2022 Memo includes an updated vessel trips table (Table 1). The number of vessel trips in the December 2022 Memo differs from what is included in the DEIS (pages 3-293 and 3-302). Specifically, the DEIS states that "…five vessel types are currently being considered for O&M of the SRWF (three for routine activities and two for non-routine activities" (page 3-302). However, Sunrise Wind expects only two vessels to be used for O&M including crew transport vessels and service operation vessels, which is specified in the December 2022 Memo.	Updates were made based on the most recent March 2023 memo.
Additionally, the estimated number of animals that may experience post-traumatic stress and behavioral disturbance from up to three UXO/MEC detonations in the SRWF without attenuation (DEIS page 3-283, Table 3.5.6-6) are incorrect and should align with the values included within the December 2022 Memo. to this letter provides additional instances of this type of discrepancy in the DEIS that were identified during Sunrise Wind's review.	Updates were made based on the most recent sound analysis.
Sunrise Wind believes the reliance on the National Oceanic and Atmospheric Administration's (NOAA) Marine Recreational Information Program (MRIP) data cannot be used as a method to draw direct impact conclusions. The statement "across the five states that would most likely utilize fishing areas around the Lease Area, New York had the highest number of trips, followed by New Jersey and Massachusetts. Most of these trips were typically within state waters and from shore" (DEIS page 3-399) could overestimate the impacts of Lease Area activities to for-hire recreational fishing activity from all states, especially New York and New Jersey, two states that are quite distant from the Lease Area. It is not a sound assumption to say fishing trips in federal waters would take place in the Lease Area based on MRIP data; as is indicated in the DEIS, MRIP data	Section 3.14, *For-Hire Recreational Fishing*, notes there are limitations to the MRIP data as there is no special information on where the fishing trips took place relative to the Lease Area. This is the best information available at this time and is meant to provide general angler efforts.

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must be carefully caveated, as the MRIP does not contain a way to determine locations within its data. Similarly, trips occurring in state waters cannot occur in the Lease Area. Sunrise Wind invites reconsideration of the distribution of fishermen by state to ensure methodological shortfalls within the data do not misattribute any impacts, and requests clarification of the term 'fishing areas around the Lease Area'.	
Sunrise Wind believes the reliance on experience relative to the Block Island Wind Farm's (BIWF) popularity with recreational fishermen may overestimate impacts to commercial fishermen. The DEIS relates that commercial fishermen perceive recreational fishermen would crowd the Sunrise Wind Lease Area, based on one example. The Sunrise Wind Farm (SRWF) is not a direct parallel to the BIWF. For example, the SRWF is not very close to an otherwise popular near-shore fishing destination. Similarly, the SRWF is not very close to a principal recreational fishing port. Making such a comparison does not acknowledge external motivators of recreational fishermen, some of which are: fuel cost, cost of time to navigate to the Lease Area, and the desirability of bypassing dozens of closer similar structures from previously constructed wind farms (e.g., South Fork, Revolution, Vineyard Wind) in order to arrive at the SRWF.	Acknowledgment of differences in recreational fishermen usage between the BIWF and the SRWF has been included in the Final EIS analysis in Section 3.14.
Sunrise Wind respectfully notes an apparent catch-22 in the logic chain relating to impacts due to entanglement and gear damage/loss. DEIS page 3-429 indicates some recreational fishermen would find fishing harder, because their target species might use a structure to break off from hooks and lines. Insofar as these fish are attracted or otherwise present in the Sunrise Wind Lease Area as a result of a structure, or that targeting these fish is more efficient due to a structure, we request the inherent hazards with fishing around a beneficial structure not be included as an adverse impact.	This language in the Final EIS identifies both the positive aspects of creating structure for fish and the negative aspect of potential gear damage/loss to fishermen. Providing both conditions is important to consider and is consistent with other BOEM EISs.

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Sunrise Wind requests that the long-term beneficial impacts that offshore wind-driven port use and expansions will have on commercial fisheries and recreational vessels over the long term also be discussed in the FEIS, including: • Port infrastructure improvements that will be utilized not only by the offshore wind industry, but the maritime industry at large; • Maintenance dredging and/or deepening activities that will aid safe navigation for fishing and recreational vessels; and • Increased local revenues from use of dockside services such as repairs, fueling, and provisioning.	Acknowledgement of some of the indirect benefits to other industries as a result of port use and expansions was in the Draft EIS and expanded slightly within the Final EIS based upon the comment provided and additional available information.
We recognize that loss of insurability is a fear for many people, however Sunrise Wind is unaware of any insurer that has indicated they would deny insurance or raise rates for fishermen and requests that this lack of substantiation be discussed in the FEIS. Sunrise Wind welcomes additional conversations with these companies and would seek to address their concerns and would seek to mitigate some fishermen's' individual risks through our fisheries compensation measures.	Thank you for your comment. The text has been revised to clarify this is a concern of the fishing industry, but to date, specific instances have not been identified.
Section 3.6.2.5.2.2 of the DEIS states that lighting of offshore facilities and structures from the Proposed Action is anticipated to have "negligible to moderate, long-term impacts on above ground historic properties" (page 3-477). While describing cumulative impacts of the Proposed Action, Section 3.6.2.5.4.2 (page 3-482) concludes that: "Lighting from the Proposed Action combined with ongoing and planned activities could have negligible to minor impacts on cultural resources depending on the scale and intensity, largely determined by the number of visible lights and their proximity to resources, of the impacts and the unique characteristics of individual historic properties." It does not seem reasonable that the impact of just the Proposed Action from vessel and structure lighting would be negligible to moderate (page 3-477), whereas the cumulative	Cumulative impacts of the Proposed Action with respect to lighting were found to be consistent in BOEM's analysis.

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impact of the Proposed Action combined with other activities would have a negligible to minor impact (page 3-482). Sunrise Wind recommends revising the impact determination in the FEIS for the Proposed Action from lighting of vessels and structures to be negligible to minor, particularly given the significant reduction in lighting due to the implementation of an aircraft detection lighting system, which would limit the activation of the aviation obstruction lights on WTGs to only occur when aircraft approach the structures (I.e., approximately 1.4 hours per year), as well as Sunrise Wind's commitment to light and mark WTGs 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.	
Sunrise Wind requests that BOEM re-evaluate potential impacts on demographics, employment, and economics and update the FEIS accordingly. In accordance with the COP and given numerous economic benefits and environmental protection measures, the Proposed Action is anticipated to have negligible adverse impacts and minor beneficial impacts on demographics, employment, and economics.	Additional information has been included in Section 3.16 of the Final EIS based upon comments received and new information that has become available. The conclusions of both potential adverse and beneficial impacts are summarized in Table 3.16-12.
Sunrise Wind agrees with the following conclusions in Section 3.6.4.6.5 (page 3-609): "Considering the combined impacts of all IPFs, BOEM anticipates that the Proposed Action would have overall negligible to` moderate impacts on all (Environmental Justice) EJ populations, and therefore BOEM determined that impacts of the Proposed Action on low-income and minority populations would not be disproportionately high and adverse and could be avoided or reduced with AMPs or would be unavoidable but not disproportionately high and adverse." However, Sunrise Wind respectfully requests additional clarification and/or justification in the FEIS to support other statements that say the impacts would fall disproportionally on EJ communities. It does not appear that the DEIS fully takes into account the impacts of existing activities already	Acknowledgement of the development and implementation of an Onshore Maintenance and Protection of Traffic Plan (Appendix H, Table H-1, APM Number GEN-15) has been included in Section 3.17, *Environmental Justice*, where appropriate.

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occurring in EJ communities (at ports, for example), the presence of non-EJ block groups in the Project Area, or measures Sunrise Wind would take to minimize impacts to EJ communities (e.g., traffic control plans). For example, page 3-582 states: "Based on the geographic extent of onshore construction impacts relative to the location of EJ populations, BOEM concludes that EJ populations would experience disproportionately high and adverse effects related to construction, O&M, and decommissioning of onshore infrastructure."	
Another example is on page 3-595, which states: “The OnCS–DC, Onshore Transmission Cable and Onshore Interconnection Cable are located within, adjacent to, or within the vicinity of several Census Block Groups that are considered EJ communities (as shown Figure 3.6.4-1), and therefore have an adverse disproportionate impact on these communities; however, these activities would be short-term nature and are considered to be a minor disproportionate, adverse impact." Figure 3.6.4-1 shows that the onshore facilities would also traverse non-EJ block groups, indicating that the minor, short-term air quality impacts would not necessarily be disproportionate on EJ areas.	The presence or potential for an adverse impact on a non-environmental justice community does not necessarily negate the potential for a disproportionate impact on an adjacent environmental justice community. The environmental justice analysis both identifies where communities with environmental justice populations exist, as well as what adverse impacts may be present, which can help inform mitigation and outreach.
In addition, page 3-603 states: "Overall, the presence of structures in the offshore environment from the Proposed Action will have minor to moderate impacts on marine businesses (Section 3.6.1 Commercial` Fisheries and For-Hire Recreational Fishing and Section 3.6.8 Recreation and Tourism), resulting in long-term, continuous, minor impacts on EJ populations due to the impact on low-income workers in marine industries and low-income residents who rely on subsistence fishing." This part of the analysis examines fishing communities in an EJ context. However, it is unclear how the impact analysis on the fishing community differs from the analysis conducted in Section 3.6.1 of the DEIS, which focuses on the impacts to Commercial and For-Hire Fisheries.	Many individuals working within the marine and fisheries industries within the GAA could be considered individuals who may be considered low-income earners in the context of the Project's environmental justice population. The environmental justice analysis takes into account conclusions from the commercial fisheries and for-hire recreational fishing analyses and evaluates the potential impact with respect to vulnerable populations. To that end, if there is a potential long-term, continuous impact to commercial fisheries and for-hire recreational fishing operations, that could ultimately have a negative impact on some of the individuals employed in that industry.

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On page 3-679, the DEIS says the Proposed Action will create potential major adverse impacts on USCG Search and Rescue (SAR) operations. Elsewhere in the document (e.g., page 3-675, Table ES-2), these impacts are listed as moderate adverse. Similarity, adverse impacts from Alternatives C-1 and C-2 are described as major to USCG SAR operations on page 3-681 and page 3-683, but moderate on page 3-682 and 3-683. Sunrise Wind believes a major adverse rating is incorrect here, and even the basis for moderate adverse requires clarification.	Potential impacts on USCG Search and Rescue (SAR) operations from Alternative B, Alternative C-1, and Alternative C-2 are all described as moderate adverse impacts. BOEM has described the cumulative impact (impacts from ongoing and planned activities, including offshore wind and the alternatives) on USCG SAR operations as major adverse impacts. The installation of such a large number of WTGs through the GAA would hinder USCG SAR operations across a larger area, potentially leading to increased loss of life. Major impacts for other uses would be unavoidable even with EPMs, where additional mitigation could be required. While Sunrise Wind can utilize EPMs to minimize but not fully resolve the impacts of the alternatives analyzed in this EIS, the cumulative impact of all reasonably planned future activities cannot be minimized with EPMs to the level that it should be defined as moderate.
Page 3-677 states: "...the presence and layout of large numbers of WTGs could make it more difficult for SAR aircraft to perform operations, necessitating changes in USCG SAR operational procedures, leading to less effective search patterns or earlier abandonment of searches." Sunrise Wind respectfully disagrees with this statement both on a technical level, and in the way it misconstrues the USCG's stated posture toward SAR operations in wind farms.	This statement has been revised in Section 3.20.1.2.
Search effectiveness is measured by the probability of a sensor detecting a particular object, placed against the probability of the object being in a particular area while that area is being searched. Aeronautical hazards, such as WTGs, are not considered in modifying sensor effectiveness: fatigue, weather induced conditions, and moon illumination are. Search planners create search patterns using a limited selection of line and box searches in a computer program. The program is structure-agnostic and does not recognize land/water boundary. Detection models are similarly	At this time, BOEM does not have the information to evaluate the impact of WTGs on the effectiveness of USCG measures, so the text in Section 3.20.5.2.2.1 has been revised to reflect this. USCG SAR activities could be hindered within the SRWF due to navigational complexity and safety concerns operating among WTGs. The USCG may need to adjust its SAR planning and search patterns to accommodate the WTG layout. These changes in SAR procedure have the potential to result in adverse impacts, as it

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limited, and make broad assumptions based on limited empirical testing of a small set of possible drift objects, sensors, and human performance data. The search planning software produces an optimal search pattern based on given inputs, but planners often de-optimize the plan; for example, the planning software may attempt to place a vessel search partially on land or may not consider the human physical and visual impacts to searching against the waves or the sun's glare. Finally, search assets rarely perform the search exactly as planned, often varying from the optimal speed, courses, and duration of search. The USCG has no definitive method to track actual search effort other than relying on voice reports from the scene; there is no 'black box' assessing actual searches conducted, and therefore it is difficult for the USCG to say with certainty that one search is more or less effective than another	could complicate the SAR process.
Sunrise Wind also notes that USCG SAR policy does not allow for ineffective searches to be suspended due to potential ineffectiveness. Inadequate or ineffective searching for any reason generally results in more searching for longer periods of time, generally until the probability of surviving at sea is more than exhausted. Conversely, excellent search conditions under ideal circumstances might result in quicker search suspension. In discussing search suspension, the USCG's Addendum to the National SAR Supplement cautions against non-aggressive search prosecution or minimal effort, even in the face of objective risks, such as nighttime and weather.	Thank you for your comment.
Sunrise Wind also notes that the Massachusetts and Rhode Island Port Access Route Study (MARIPARS) specifically calls out the 1x1 nm grid layout as being permissive to USCG SAR operations. "One NM spacing between WTGs allows aircrews to safely execute turns to the adjacent lane using normal flight procedures in visual conditions. On scene conditions or WTG spacing less than 1 NM may require aircrews to deviate from normal flight procedures or to transit the entire length and conduct	Thank you for your comment.

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turns outside of the wind farm. One NM spacing may allow sufficient navigational room for aircrews to execute USCG missions in diverse and challenging weather conditions or deal with an aircraft emergency and/or navigational malfunction."	
For many SAR missions, there may be no impact, and it can be anticipated the USCG would assign appropriate alternate or additional resources and resource time to mitigate any issues. Search planners can account for operator fatigue or increased drift of a search object while a resource is off task by assigning more resources or search time.	Potential impacts to USCG SAR operations from Alternative B, Alternative C-1 and Alternative C-2 are all described as moderate adverse impacts. BOEM has described the cumulative impacts, which is defined as the impacts as a result of ongoing and planned activities including offshore wind and the alternative analyzed, to USCG SAR operations would be major adverse impacts. The installation of such a large number of WTGs through the GAA would hinder USCG SAR operations across a larger area, which has the potential to lead to increased loss of life. Major impacts for other uses are defined as impacts that would be unavoidable even with EPMs, where additional mitigation could be required. While Sunrise Wind can utilize EPMs to minimize, but not fully resolve the impacts of the Alternatives analyzed in this EIS, the cumulative impact of all reasonably planned future activities cannot be minimized with EPMs to the level that it should be defined as moderate.
Sunrise Wind anticipates the USCG would itself adapt to or use Sunrise Wind components to aid in its mission. For example, a boater in distress can quickly pass their position to the USCG via radio by referencing the nearest wind tower. Very high frequency coverage of the area, in partnership with Sunrise Wind, is increased, allowing authorities to be alerted to, and indirectly communicate with, distressed mariners. Trained mariners associated with the Wind industry would be routinely present in the Lease Area and are able to monitor communications and potentially render aid. The USCG's 2022 memo, Guidance for Response Operations in and Around Wind Farms, alludes to all these facts and more, addressing	Thank you for your comment. It has been noted and has been included in ongoing discussions with USCG.

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positive and negatives of operations within windfarms, including mitigators, and does not conclude any major impacts or place any proscriptive policy concerning SAR operations.	
Sunrise Wind believes these facts, balanced against the perceived risk to aircraft access, reduce the impact rating to moderate, and not major. The impact can be summed as creating some more work for search planners than before, akin to planning a search near shore, and more careful operations for crews piloting aircraft or vessels searching within the windfarm, possibly requiring increased attention to operational risk mitigation. We request that the wording that suggests helicopters would not access Sunrise Wind be clarified in the FEIS, and that search planning effectiveness be considered impacted, and to a much lesser extent, search execution.	Potential impacts to USCG SAR operations from Alternative B, Alternative C-1 and Alternative C-2 are all described as moderate adverse impacts. BOEM has described the cumulative impacts, which is defined as the impacts as a result of ongoing and planned activities including offshore wind and the alternative analyzed, to USCG SAR operations would be major adverse impacts. The installation of such a large number of WTGs through the GAA would hinder USCG SAR operations across a larger area, which has the potential to lead to increased loss of life. Major impacts for other uses are defined as impacts that would be unavoidable even with EPMs, where additional mitigation could be required. While Sunrise Wind can utilize EPMs to minimize, but not fully resolve the impacts of the Alternatives analyzed in this EIS, the cumulative impact of all reasonably planned future activities can not be minimized with EPMs to the level that it should be defined as moderate.
Sunrise Wind notes that Table H-1 of the DEIS Appendix H, Mitigation and Monitoring, is titled 'Applicant Proposed Measures'. However, while there are similarities to many of the listed measures, as written, they are not verbatim from the Project's COP environmental protection measures tables (e.g., ES-1) or other supporting appendices (e.g., Protected Species Mitigation and Monitoring Plans [COP Appendices O2 and O3]; Post-construction Avian and Bat Monitoring Framework [COP Appendix P2]). They do instead appear to align more closely with the Table H-1 mitigation measures from BOEM's DEIS for the Ocean Wind Project. For example, measure BENTH-04 states: "Perpendicular crossings of sand ridges and troughs by IAC would be minimized." This aligns with the Ocean Wind	Appendix H has been revised to address this comment.

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Project where such seafloor features exist. However, these features were not identified for the Sunrise Wind Project and should not be included in the FEIS.	
Other examples include Measure Bird-02 on page H-8, which proposes to "...evaluate avian use by conducting digital aerial pre-construction surveys for raptor nests, wading bird colonies, seabird nests, and shorebird nests during nesting periods," and Measure TCHF-03 on page H-7, which states: "During construction and O&M, surveys will be conducted for seabeach amaranth for the entire Project footprint during the growing season of May 15 – November 30, <1 week before start of Project activities." These measures were not proposed in the COP and therefore should not be included in Table H-1. Fisheries Monitoring measures related to eDNA Sampling, Glider-Oceanography, and Pelagic Fish on page H-47 are also not relevant to Sunrise Wind and should not be included in the FEIS.	Appendix H has been revised to reflect the mitigation measures proposed by Sunrise Wind and has removed those from Table H-1 that were not included in the COP.
Measure CFHFISH-04 on page H-14 states: "...at least 90 days 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), the Lessee must provide DOI with a boulder relocation plan." This measure appears to belong in Table H-2, as this is also not an applicant-proposed measure. Further, BOEM requested that Sunrise Wind provide a Boulder Relocation Plan in January 2023, which Sunrise Wind has since provided. Therefore, this measure should be removed from the FEIS.	Table H-1 of Appendix H has been revised to remove this mitigation measure as an APM.
The text introducing Table H1 (DEIS Appendix H, page H-1) says: "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 Draft EIS. These APMs are described in Table H-1 and assessed as part of the Proposed Action." As demonstrated by the above examples, Table H-1 does not consistently	Table H-1 has been revised to reflect the COP.

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reflect applicant-proposed or even necessarily appropriate measures, and as such, Sunrise Wind prefers if the measures listed in the FEIS were taken directly from those committed to in the COP and supporting appendices.	
Mitigation for Oceanographic High Frequency Radars Measure Number 2 on page H-51 lists options that have been identified to mitigate operational impacts on oceanographic high-frequency radars. In principle, Sunrise Wind can agree to data sharing with the radar operators as a mitigation, among other potential mitigations, but respectfully requests that limits be placed on the terms "and other oceanographic data," "In the public domain," and "operational state." Based on this paragraph, it is unclear what information radar operators need, and some of this data, especially hub-height wind speed and operational data, may be proprietary and therefore unsuited for open public access. We request these terms be clarified in the FEIS.	Appendix H has been revised in response to this comment.
Coordination with Federally Recognized Tribal Nations Measure Number 7 on page H-67/68 states: "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…" Sunrise Wind does not object to soliciting interest from federally recognized Tribal Nations in participating as active monitors onboard vessels during construction and/or maintenance activities. Additional information would be required from the interested federally recognized Tribal Nations to best accommodate any concern or designate which activities are to be monitored. 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	Appendix H has been revised to reflect this comment.

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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 four weeks) and be limited to the available berthings so as not to impact the availability to construction personnel. The proposed measure also states: "At a minimum, the Lessee must offer access to the following federally recognized tribal nations: Delaware Nation; Delaware Tribe of Indians; Stockbridge-Munsee Community Band of Mohican Indians; and Wampanoag Tribe of Gay Head (Aquinnah)." The list of tribal nations should be updated in the FEIS to reflect those federally recognized tribal nations invited to consult on the Sunrise Wind Project (i.e., the 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).	
It should be clarified that Sunrise Wind was assigned Lease OCS-A 0487 and the portion of OCS-A 0500 from Deepwater Wind New England, LLC and Bay State Wind, LLC, respectively.	Footnote provides clarity in the *Executive Summary* and Chapter 1, *Introduction*.
The Proposed Action is correctly identified elsewhere in the DEIS as up to a 1,034-MW facility. Please include up to' when referring to the	Text has been revised to include "up to" when referring to the generating capacity of the Project.

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generating capacity of the Project.	
Please include a reference to this guidance. This appears be from BOEM's Draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585 (June 23, 2022). If so, it should be clarified that this is draft guidance and may be modified in response to public comment.	Added reference to draft that may change based on public comment.
Please consider clarifying if other projects also have overlapping construction schedules in 2025, as the Proposed Action includes construction activities in 2025.	The text in Sections 3.4.3.2, 3.5.3.2, and 3.17.4.2 have been updated to reflect the projects with planned overlapping construction schedules in 2024 and 2025. Additionally, Table 2.1-4 in Section 2.1.2.1.1.7 reflects the most recent updated construction schedule based on the EM&CP.
The COP does not specifically mention these Tier limits. This should be clarified.	The text in Section 3.4.5.1.1 was updated. The specific reference to tier limits was removed and it now simply states that equipment will meet applicable air emission standards.
This is inaccurate. It should be clarified that OCS-DC generators would also be used during planned maintenance shutdowns and testing periods.	The text in Section 3.4.1.5.1.1 (now 3.4.5.1.1 in the Final EIS) and Section 3.5.7.2.2 was clarified to state that diesel generators may be used during commissioning or emergencies on the WTGs as discussed in Section 4.3.4.3 of the COP, and to indicate that generators on the OCS-DC may be used during planned maintenance or shutdowns.
The proposed Temporary Landing Structure is temporary and would not be used during O&M activities. As such, the description should be clarified or removed.	The mention of docks in Section 3.5.5.2.1 (previously Section 3.4.2.5.2.1 in the DEIS) was meant as a general example of the type of structure that may be located in coastal waters and was not referring to the temporary landing structure. The text was removed.
It should be clarified that the proposed WTG model for the Project does not contain an emergency generator. If necessary during an emergency, a diesel generator may be brought to the site and located temporarily on each impacted WTG.	The text in Section 3.5.7.2.2 (previously Section 3.4.2.5.2.2 in the Draft EIS) regarding the emergency generator was clarified.

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The ESA listing status for NLEB and tri-colored bat are not up to date. Any references to the 4(d) rule for NLEB are no longer appropriate and should be removed. It should also be noted that any tree-removal temporal restrictions would minimize risk to both species.	The text in Section 3.6.5.1.1 has been revised as recommended.
Please clarify this inconsistency.	The text regarding the cumulative impacts to bats was updated. The correct impact level should be negligible to minor.
Text under the Presence of Structures subheading states: "...adverse impacts to bats from collision would be minor and long-term." Would be a 'negligible' or 'negligible to minor' (and not a minor impact) for the Proposed Action considering that the DEIS notes the use of echolocation to avoid structures and states that impacts related to collision mortality cannot be quantified.	We agree that the impact level determination should be negligible to minor, and the text has been updated accordingly in Section 3.6.5.2.2.
This 10-mile buffer refers to the area considered as the geographic analysis area by the DEIS, but it does not equate to the area sampled for site-specific results for the Project. This should be clarified.	Text was revised in Section 3.7 to "For the assessment of future offshore activities, the analysis area was expanded to include an approximately 10-mi (16-km) buffer to allow broader characterization and variation of the surrounding habitat using findings from prior and ongoing studies of benthic environments in the Southern New England region More specific analysis is supported by the site-specific surveys conducted within the SRWF Lease Area."
This is incorrect. The G&G surveys covered this buffer for the SRWEC, but not the ICW or the Lease Area. The origin of the 10-mi buffer is not clear; it is not in Appendix M1 as cited in the DEIS.	Replaced text in Section 3.7.1.1 with updated definition of the study area from the Aug 2022 COP: "The Benthic Habitat Study Area is inclusive of the areas Sunrise Wind surveyed for siting the SRWF in the Lease Area, the SRWEC–OCS, the SRWEC–NYS, and ICW HDD. The SRWEC–OCS and SRWEC–NYS Study Areas are corridors that were surveyed to support siting of the export cable bundle (Sunrise Wind 2022 COP, Appendix M3)."

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Environmental protection measures related to benthic habitat are included in COP Section 4.4.2.3 and do not specifically mention turbidity controls. Please clarify to align with the correct applicant proposed measures.	Turbidity control was removed from Section 3.7.5.1.1 and updated with language from the August 2022 COP.
Alternative C-1 does not change the number of proposed WTGs or their generating capacity, so this statement should be revised.	The statement was revised to clarify that Alternative C-1 eliminates WTG positions.
BOEM should clarify the spatial area around each WTG used to identify boulder density, as a 250-km^2 area around each WTG equaling an 8.92-km radius circle around each WTG. The PDE only includes boulder clearance within a 220-m radius (0.15 km^2) around WTG positions.	The density of boulders is expressed using the units of boulders/250 km^2 that was used in the data in the earlier versions (See Figure 3.7-1 in Final EIS). Boulder densities for WTG positions (Appendix B) are still in this set of units- so no changes have been made to the numbers.
These alternatives do not reduce the number of WTGs; therefore, these statements should be revised. Further, the following clarifications should be made for Alternative C-2: Due to the increased distance from the OCS-DC of the up to 12 relocated positions, additional IAC could be needed. However, this may vary, depending on the final layout under the Alterative B Proposed Action. The up to 8 WTGs would only be removed from Priority Area 1, and the up to 12 relocated positions would be relocated from Priority Areas 1, 2, 3, and/or 4.	The text was revised to clarify that Alternative C-1 does not reduce the number of positions.
This is a slightly different description of how areas for prioritization were identified for Alternative C-1 in Section 3.5.2.6 on page 3-114, which states that "NMFS identified priority areas for habitat conservation based on backscatter data". BOEM should clarify how areas for prioritization were identified and keep consistent description	Text was added to Section 3.7.6, Alternative C-1.
Sunrise Wind suggests including mention in the Proposed Mitigation Measures Section (and/or elsewhere where BOEM determines relevant) that 3 potential WTG positions within the uniform east- west/north-south grid (1 x 1 nm spacing) located in Priority Area 1 in the northwest corner	Thank you for your comment. BOEM has noted the reduction in impacts due to exclusion of development of several WTGs as a result of installation constraints.

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of the Lease were removed by Sunrise Wind from consideration in the PDE to reduce benthic habitat impacts.	
Sunrise Wind did not propose to perform these surveys. This text should be removed.	Noted. Text was removed from Section 3.8.5.1.
There are no cofferdams or defined beach work areas included in the Project. This statement should be revised to "Noise from installation of the casing pipe or sheet piles…" to more accurately reflect potential activities in the PDE.	Text in Section 3.8.5.1 has been revised to "Noise from installation of the casing pipe or sheet piles…"
This statement should be revised to clarify that no on-beach work (i.e., between the back dune and mean low water) would occur April 1 through August 31. Construction activities could occur during this time in areas that are not on the beach.	Text in Section 3.8.5.1 has been revised to include "no on-beach construction activities (i.e., between back dunes and mean low water) are scheduled to occur during the roseate tern and piping plover breeding periods (i.e., April 1 through August 31)," as recommended.
Development is regulated in this area, but it is not prohibited. Sunrise Wind's application for a Core Preservation Area Compelling Public Need and Hardship was granted in April 2022.	Thank you for your comment. The following change has been made to Section 3.9.1: Replaced "Development is prohibited in the designated Central Pine Barrens Core Preservation Area." with "Development in the designated Central Pine Barrens Core Preservation Area is regulated, but it is not prohibited. Sunrise Wind's application for a Core Preservation Area Compelling Public Need and Hardship was granted in April 2022." The link to the approval is: https://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=303480&MatterSeq=64180.
Sunrise Wind requests the table be revised to state "None observed, potential habitat at landfall/ICW study area but outside of landfall work area and ICW work area" to reflect the field results more accurately.	Thank you for your comment. Table 3.9.2 (previously Table 3.5.4.2) has been revised as requested.
Thirty-eight percent seems high. Please clarify if percentages reflect the refined workspace.	The 38.3 percent reflects 39.3 acres of designated habitats (Significant Coastal Fish and Wildlife Habitats [SCFWH], significant natural communities, and Critical Environment Areas

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	[CEAs]) of the total 102.7-acre footprint of onshore facilities, including transmission line, substations, converter station, HDD/ICW work areas, and splicing vaults. This information is provided in Table 3.9-4 (previously Table 3.5.4-4 of the Draft EIS). No changes have been made.
Sunrise Wind did not propose in its COP any plant-specific time of year restrictions related to these activities. Please clarify to align with the correct applicant proposed measures. Other time of year restrictions (i.e., those for nesting shorebirds and summer tourism) would overlap with most of the seabeach amaranth growing season and provide protection measures.	The reference to the plant-specific time-of-year restrictions is based on the draft Biological Assessment for impacts to USFWS-listed species for SRW, which states "Time-of-year restrictions for certain work activities (e.g., HDD conduit stringing) will be applied to the extent practicable to avoid or minimize direct impacts to sandplain gerardia, seabeach amaranth, and their habitat during construction of the landfall and onshore facilities. If work is anticipated to occur outside of these time-of-year restriction periods, coordination with state and federal agencies will be accomplished to develop construction monitoring and impact minimization plans or mitigation plans, as appropriate." The Final EIS will be revised based on the final Biological Assessment/Biological Opinion as needed.
It should be noted that the Project has proposed a 20-ft operational corridor for onshore facilities, all references to a 60-ft corridor should be revised. Also, totals provided in the Project footprint discussion (Section 3.5.4.5.1.1) do not match those provided in Section 3.5.4.5.2.1.	This has been updated to a 30-ft (9.1-m) operational corridor based on the new 2023 COP. Sections have been edited to match.
The text reports the cod spawning period as December through May. This does not match what is reported in the two studies that were cited. Dean et al 2020 described the spawning period as occurring from November through March, with peak spawning from December through February. Langan et al. 2020 described cod spawning as occurring from late December through mid-February based on the back-calculated growth rates of larvae collected in Narragansett Bay.	The text was updated in Section 3.10.1.3 to describe spawning in the SRWF area from October through March as described in Van Hoeck et al. 2023.

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It is not clear in the text describing the IPFs associated with the Proposed Action what the impact level determination is for seafloor disturbance and sediment suspension and deposition. Impacts are described as 'low' or 'small'. There is no clear designation of a minor or moderate impact for these two IPFs- this may be important as these two IPFs specifically relate to the difference between the impact determinations for the Proposed Action and Alternative C options. Similarly, it is not clear in text describing the IPFs associated with the Proposed Action what the impact level determinations are for accidental releases during onshore O&M; or for offshore O&M cable maintenance, light, and noise.	Impact levels associated with the Proposed Action were reviewed and updated.
No gillnet sampling is proposed in the Project's Fisheries and Benthic Monitoring Plan (COP Appendix AA1), so this statement should be removed.	The reference to gillnet sampling has been removed.
As the discharge of cooling water is not an accidental occurrence, this section should be re-labeled.	The IPF was changed to "Discharges" in Section 3.10.5.2.2.
This discussion should be updated in the FEIS to indicate the status of surveys that have already begun (or may have begun prior to the FEIS): Acoustic telemetry receivers were deployed in the Lease Area (for highly migratory species) in spring 2022 and tagging will begin in 2023; Acoustic telemetry receivers were deployed along the SRWEC-NYS in summer 2022; tagging of sharks, elasmobranchs, lobster and horseshoe crab in NYS waters began in summer 2022 and will continue in 2023; A HabCam survey was completed in summer 2022 and another will be completed in 2023; and The trawl survey may begin in summer 2023, after issuance of the NMFS Biological Opinion.	The survey start dates were added to the descriptions.

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It should be clarified that pile driving for the Project may occur from May through December.	Text was updated in Section 3.10.3.3 and 3.10.5.5 to indicate pile driving will occur from May to December.
The "and complex bottom habitat areas" should also be included in the Alternative C-1 statement.	Text was updated in Section 3.10.9, Table 3.10-4.
“In situ disposal would be performed with low noise methods like deflagration of the MEC/UXO or cutting the MEC/UXO up to extract the explosive components.”. This statement seems to preclude the potential use of high order detonation. It should be clarified that high-order detonation could be used as method to dispose MEC/UXOs. The text also seems to imply that noise attenuation would be required for all activities, including Lift and Shift. BOEM should clarify which disposal methods would require noise attenuation.	Base analysis is included in Section 3.11.5.1.2.2. This section references Appendix G2 of the COP (Ordtek 2022), which has the full risk assessment and mitigation strategy decision guide. This guide is too extensive to include in the EIS, however, the information included in the analysis evaluates the anticipated worst-case scenario for detonation.
The text includes descriptions of several survey methodologies that are not proposed in the Project’s Fisheries and Benthic Monitoring Plan (COP Appendix AA1). Sunrise Wind is not proposing to conduct eDNA sampling; structure associated fisheries surveys; clam, oceanographic, and pelagic fish surveys; or trap surveys. This section should be updated to reflect the Sunrise Wind Fisheries and Benthic Monitoring Plan.	Section 3.11.5.1 has been updated to reflect the Fisheries and Benthic Monitoring Plan and includes reference to the trawl survey. Reference to eDNA has been removed.
Sunrise Wind could not determine the source of the numbers and requests that they be updated to match the August 2022 COP. Note that the SRWEC is up to 104.6 mi. It is not correct to say that cable would be unburied; rather, up to 15 percent of the IAC (27 mi) and up to 5 percent of the SRWEC (5.2 mi) could require secondary cable protection (including jointing, but not including cable crossings).	This information was updated using the August 2022 COP information and the latest version of the Project Description.
There are no wetlands crossed by the onshore portion of the Project. This sentence should be modified to note the Project is adjacent to wetlands at the Carmans River but will not cross or impact any wetlands.	Thank you for the comment. The text was updated in Section 3.13.1.
Figure 3.6.1-3 may double count some vessels. It is possible that vessels go both more and less than 5 knots in the Lease Area. The text on page 3-	The comment is correct, and the text has been revised. The total unique vessels (per Figure 3.14-4 is 414) and some vessels may

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392 above the figure states "Figure 3.6.1-3 indicates that approximately 34 percent of the 765 unique vessels identified operating in the Lease Area during the above-referenced period were actively fishing". Because some vessels may go both more and less than 5 knots in the Lease Area, the number of unique vessels may be overestimated. BOEM should clarify how the data was used to produce the figure and numbers.	be counted more than once if they transit the Lease Area at different speeds or are engaged in both fishing and transiting. Text has been added to clarify this statement and histograms were updated.
Sunrise Wind respectfully disagrees with this statement. While anchored vessels make an area of sea unavailable to fishing (as do non-anchored vessels), they are not a navigational hazard. This should also be clarified on page 3-417.	The discussion of a navigation hazard (whether temporarily anchored or non-anchored) within the EIS is consistent with other BOEM EISs when discussing offshore activities and their impacts to commercial fisheries and for-hire recreational fishing.
Sunrise Wind suggests rewording this sentence to explain how a cultural resource could be affected/impacted.	Thank you for your comment.
This discussion should also note that geoarchaeological cores were taken as part of the geotechnical campaigns to further evaluate paleo landscape features for the potential to elucidate archaeological resources.	The information in the Finding of Adverse Effect (FoAE) has been updated to reflect avoidance based on additional information regarding ancient submerged landforms (ASLFs).
BOEM should clarify that one ancient submerged landform (ASLF) may potentially be disturbed from anchoring or jacked-up vessels utilized to conduct O&M of the nearby WTG. Sunrise Wind is continuing to evaluate options to avoid or minimize disturbance to the referenced ASLF.	The information in the FoAE has been updated to reflect avoidance based on additional information regarding ASLFs.
With the addition of the 3 National Historical Landmarks in Newport, Rhode Island, these statements should be updated to 47 properties.	Appendix J, the FoAE, has been updated to reflect 47 adverse impacts within the Visual APE.
BOEM should clarify if these minimization and mitigation measures will be included in the MOA and/or ROD, instead of the COP approval.	Appendix J in the Memorandum of Agreement (MOA) has been updated to reflect avoidance, mitigation, and minimization measures.
Sunrise Wind recommends the FEIS mention that mid-tower aviation lights are dimmer than nacelle aviation lights.	As described in Section 3.5.7 of the COP, the lights would consist of two L-864 medium intensity red lights mounted on the nacelle and up to three L-810 low intensity red lights mounted on the midsection of the WTG. Therefore, Section 3.16.3.1 (previously Section 3.6.3.3 of the Draft EIS) has been revised to mention that

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	mid-tower aviation lights are dimmer than nacelle aviation lights and not describe the two as the same.
The list of invited tribes should include the Mohegan Tribe of Indians of Connecticut, the Narragansett Indian Tribe, and the Delaware Tribe of Indians, along with the five non-Federally recognized tribes, to align with the List of Invited and Participating Consulting Parties in Table 1 of Attachment 2 to the MOA (DEIS Appendix J).	The three federally recognized Tribes have been added to the Final EIS, along with a reference to five non-federally recognized Tribes that could be considered environmental justice communities.
This statement contradicts the conclusions, which do not identify any major EJ impacts (see Table 3.6.4-5).	The Final EIS text has been updated to more accurately summarize the conclusions in the two areas noted. See Table 3.17-6.
This statement contradicts the conclusions, which do not identify any major EJ impacts (see Table 3.6.4-5).	The Final EIS text has been updated to more accurately summarize the conclusions in the two areas noted.
Alternatives C-1 and C-2 do not include changes to the turbine design capacity so this statement should be revised.	The text in Section 3.18.4 (previously Section 3.6.5.4 in the Draft EIS) has been revised to omit the reference to turbine design capacity.
The viewshed is not included in the GAA for Land Use and Coastal Infrastructure, as described in DEIS Appendix D, Figure D-15, and thus visual impacts should be removed from discussion in this section.	To accurately reflect the GAA for land use and coastal infrastructure, the text in Section 3.18.5 has been revised to only discuss impacts to resources within the GAA. Impacts to land use and coastal infrastructure would not stem from the offshore facilities but would potentially be impacted by the presence of structures of onshore facilities.
The applicant-proposed measure is actually "The construction of the Landfall and 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."	The text in Section 3.18.5.1.1 (previously Section 3.6.5.5 in the Draft EIS) has been revised to reflect the APM proposed by Sunrise Wind.
Sunrise Wind will consult with NPS on planned construction activities to ensure noise impacts to the Otis Pike Wilderness area are minimized to	The text in Section 3.18.5.1.1 (previously Section 3.6.5.5 in the DEIS) has been revised to clarify this statement.

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the extent practicable during construction of the Project. The recommendations associated with this NPS guide are largely applicable to the ongoing maintenance of landscaped and developed areas. It is anticipated by Sunrise Wind that, following construction, any necessary landscape or property maintenance operations within Project areas near the Otis Pike Wilderness area will be performed by the Suffolk County Department of Parks.	
A similar statement is made in the Traffic Section on page 3-632 regarding the May to September summer recreation and tourism season. The applicant-proposed measure is actually "The construction of the Landfall and 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." These sections should be clarified to align with the measure.	The text in Section 3.18.5.1.1 (previously Section 3.6.5.5 in the DEIS) has been revised to reflect the APM proposed by Sunrise Wind.
Sunrise feels that the adverse impacts may be overstated considering the Project "... is not anticipated to change the overall land use and infrastructure within the analysis area" (see page 3-627 of the DEIS).	BOEM describes the range of potential impacts from IPFs in the EIS. BOEM defines moderate impacts to land use and coastal infrastructure as "Impacts would be detectable and broad-based, affecting a variety of land uses, but would be short-term and would not result in long-term change." The Proposed Action is not anticipated to result in long-term changes to land use and infrastructure within the analysis area, but BOEM has determined that there would be detectable and broad-based impacts to traffic and land disturbance from construction activities. It is anticipated that construction activities would create short-term disturbances to traffic in the highly congested area from lane closures, shifted traffic patterns, closed roadways, and closed parking lots, resulting in detectable impacts in the area. Additionally, the Proposed Action would result in short-

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	term interruptions to recreation activities at both Smith Point County Park and the Fire Island National Seashore and in neighboring residential areas. The activities described would have both detectable and broad-based impacts to these areas, and therefore are described as moderate.
Sunrise Wind suggests including mention in Section 3.6.7.5.1.2.5 (and/or elsewhere that BOEM determines relevant) that four potential WTG positions within the uniform east-west/north-south grid (1 x 1 nm spacing) were removed due to proximity to existing cables and that Sunrise Wind has engaged with each of the identified telecommunication cable owners to discuss crossing and proximity agreements.	The text was revised to reflect this statement. Alternative C-3 mentions how WTG No. 154 was added to the layout.
Sunrise Wind is not aware of discussions related to the preclusion of NOAA Fisheries scientific surveys from cable routes, and the December 2022 NOAA Fisheries and BOEM Federal Survey Mitigation Strategy - Northeast U.S. Region does not identify cable routes as areas of concern.	The NOAA Technical Memorandum NMFS-NE-292, NOAA Fisheries and BOEM Federal Survey Mitigation Strategy - Northeast U.S. Region (Mitigation Strategy), issued in December 2022 outlines the goals, objectives, and specific actions of the Mitigation Strategy. The ultimate goal of the Mitigation Strategy is to develop and implement a Mitigation Program. BOEM states within the Mitigation Strategy that preclusion of NOAA Fisheries sampling platforms from wind development areas because of operational and safety limitations is an impact identified from offshore wind. BOEM references the Vineyard Wind 1 Offshore Wind Energy Project Final EIS, which directly states WTG foundations and cable routes as Project components that would exclude the area from potential sampling, and by impacting survey gear performance, efficiency, and availability.
These alternatives do not reduce the number of WTGs; therefore, these statements should be revised. Further, the following clarifications should be made for Alternative C-2: Due to the increased distance from the OCS-DC of the up to 12 relocated positions, additional IAC could be needed. However, this may vary,	The text was revised to reflect the correct descriptions of the alternatives.

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depending on the final layout under the Alterative B Proposed Action. The up to 8 WTGs would only be removed from Priority Area 1, and the up to 12 relocated positions would be relocated from Priority Areas 1, 2, 3, and/or 4.	
Sunrise Wind has committed to maintaining public access to all facilities at Smith Point County Park and Smith Point Marina unless temporarily necessary for safety purposes (e.g., movement of equipment near the access point to the fishing pier). Sunrise Wind recommends clarifying the commitment to maintain public access to parking lots and the fishing pier.	BOEM has clarified the statement in the text to incorporate Sunrise Wind's commitment to maintaining public access to these areas unless temporarily necessary for safety purposes.
This reference should be updated to New York State's Certificate of Environmental Compatibility and Public Need (CECPN), issued on November 18, 2022.	The reference has been updated from New York State's Article VII Joint Proposal to New York State's Certificate of Environmental Compatibility and Public Need.
This suggests that there would be long-term impacts from construction of onshore facilities. The text should be clarified that the impacts from construction would be short-term.	Construction impacts would be temporary, only lasting the duration of construction activities. The text in the conclusion of Section 3.21.5.1 has been revised to state "The construction of onshore facilities would also result in short-term, minor to moderate adverse impacts to recreation and tourism as a result of increased visible infrastructure, traffic, lighting, land disturbance, and noise."
Sunrise Wind recommends this text be removed from the FEIS. BOEM has not identified specific tournaments or events which might be impacted. Without knowing which tournaments and events BOEM believes are impacted, it is impossible to know whether or not this mitigation is even relevant. Our outreach and research have shown that while there are a number of tournaments that regularly occur during projected construction activities, there are no tournaments which take place specifically within the Project area. Sunrise Wind believes that all tournaments, with the exception of tournaments which confine participants to certain areas (i.e., state waters for striped bass), allow	This text in Section 3.21.9.1 has been removed from the Final EIS. However, Section 3.21.9.1 includes measures that should be incorporated into the Preferred Alternative for Sunrise Wind to minimize, to the extent practicable, overlap with recreational fishing tournaments.

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participants to fish anywhere they please. Therefore, even if this mitigation were put in place, there is a good possibility tournament participants would not be fishing in the Project Area, as the presence or absence of target species would determine the area fished. To our knowledge, target species for known tournaments are present throughout the region. As for 'important seasonal recreational fishing events', Sunrise Wind is not aware of any on-the-water event, other than a tournament, which would fit this definition. Therefore, we do not believe 'important seasonal recreational fishing events' would be impacted by construction activities.	
This does not align with the key observation points identified in the Visual Impacts Assessment (COP Appendix Q1, Table 2.2-2 and Table 3.2-103) and does not include Nomans Island, which is closer than any other KOP. Sunrise Wind respectfully requests clarification and/or an explanation as to the differences in KOPs between the two documents.	BOEM has conducted an independent assessment of the potential impacts to scenic and visual resources based on the visual simulations and information provided by the Applicant in the COP. The methodology and results of this assessment are presented in Appendix I of this EIS. This analysis of scenic and visual resources considers methodologies provided in the Assessment of Seascape, Landscape, and Visual Impacts (SLVIA) of Offshore Wind Developments on the Outer Continental Shelf of the United States and the Guidelines for Landscape and Visual Impact Assessment. The BOEM SLVIA has two parts, including the seascape and landscape assessment (SLIA) and visual impact assessment (VIA). The level of impact described in Table 3.22-13 (previously Table 3.6.9-13 in the DRAFT EIS) summarizes the results of this methodology. Further description of how each impact level was determined is provided in Appendix I. Nomans Island is included in the 9th row of key observation points (KOPs) described as moderate in Table 3.22-13 of the EIS and in Table 1-4.1, Table I-4.2, Table I-7, and Table I-8 of Appendix I. The results of the impact rating are discussed in Appendix I, including the

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	KOP characteristics and assessment parameters used.
EDR's cumulative visual simulations consider 1,055 structures. These discrepancies should be clarified.	BOEM has revised the text in Section 3.22.5 and in Appendix I, Section I.3.4 to clarify that the cumulative visual impacts were assessed using Environmental Design and Research (EDR)'s cumulative simulations, which consider 1,055 structures. The text has been clarified to reference that cumulative impacts to scenic and visual resources using these simulations consider 1,055 structures.
There is no discussion for navigation lighting. Sunrise Wind suggests such a discussion be added.	Section 3.22.5.2.2 has been revised to include discussion for navigation lighting.
Sunrise Wind suggests that the stated impact from presence of structures during O&M activities should be a range (i.e., negligible to major), as is stated for the Lighting IPF immediately below, as the impact to visual resources from the presence of structures would be dependent upon the distance from the SRWF, meteorological conditions, and angle of view.	The text in Section 3.22.5.2.2 describing impacts from the presence of structures has been revised to state "These changes would be long-term and would result in minor to major impacts to scenic and visual resources" to consider the range of potential impacts that would result from the Proposed Action.
There is no plan to conduct benthic habitat monitoring during construction. The Fisheries and Benthic Monitoring Plan (COP Appendix AA1) is consistent with other Orsted projects – South Fork Wind, Revolution Wind, and Ocean Wind 1 - none of which have benthic monitoring proposed for during construction (pre- and post-only).	Appendix H has been revised to reflect that benthic habitat monitoring is proposed for pre- and post-construction, not during construction activities.
These measures are relevant to both birds and bats and would reduce risk to both taxa.	BAT-02 was removed as an APM per one of Sunrise Wind's other comments.
No screening is required at the OnCS-DC, presuming that screening means a physical barrier, wall or other large obstruction for path noise control.	"Screening will be implemented at the OnCS-DC to the extent feasible, to reduce potential visibility and noise." was stated in the COP and therefore it was added to Table H-1 APM's. BOEM confirmed with Sunrise Wind through a Request for Information that this APM is still applicable.
Language regarding Sunrise Wind Export Cable can be removed, because no UXO/MEC detonations are expected to occur within the SRWEC.	Table H-1 of Appendix H has been revised.

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Sunrise Wind's Terrestrial and Marine Unanticipated Discovery Plans (UDP) (Attachments to COP Appendix Z) do not include the designation of a "Cultural Resources Compliance Manager". The Terrestrial UDP includes the designation of an Archaeologist and the Marine UDP includes designation of a Qualified Marine Archaeologist (QMA). Sunrise Wind recommends this proposed measure align with the submitted UDPs to avoid confusion.	Appendix H has been revised.
Sunrise Wind's Fisheries and Benthic Monitoring Plan (COP Appendix AA1) does not include the use of any fixed gear such as traps, pots, or gillnets. Thus, these measures should be revised or removed.	Appendix H has been revised.
While it is good that BOEM describes the option for the AMP and references the Thayer Mahan study, including the potential for nighttime piling, the statement regarding no anticipated Level A Harassment Takes is incorrect. Based on feedback from NMFS and the Updated Density and Take Estimates Memo (December 2022), small Level A Harassment Takes have been requested for fin, humpback, minke, sei whale, harbor porpoise, gray seal, and harbor seal (not coastal bottlenose dolphins). Thus, the text here should be revised.	Appendix H has been revised.
Sections III-A-2-I and III-A-2-v of the draft Memorandum of Agreement reference "3 to 5 borings" that would be collected, analyzed, and used for research. Additional borings would be required to meet the research/analysis objectives listed in these sections.	The Treatment Plan has been updated to reflect this in Appendix J of the Final EIS and incorporates previous comments on mitigation procedures.
This is an incorrect statement. The Temporary Landing Structure is a pile-supported trestle that avoids grounding at low tide.	Text in Section 3.9.4 has been revised to read "The pile-supported trestle would include direct short-term impacts of up to 1,500 ft^2 (139.4 m^2) of SAV and/or benthic macroalgae due to direct ground disturbance and shading." Sections 3.9.4 and 3.9.5 have been revised to reflect new information, including the selection of a pile-supported trestle

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	for the transfer of the construction equipment and materials that would minimize the environmental impact to the extent practicable and provide the safest platform for the transfer of the construction equipment/materials and activity of the crew. The section will also include information from the draft EFH Assessment (December 2022) which was updated with October 2022 SAV surveys using underwater video and a GPS-enabled Seaviewer drop camera along east-west and north-south transect lines in the proposed temporary landing site, where no significant populations of eelgrass were found (see EFH Assessment for details).
Figure 2.1.2.1 should be updated to include the latest SRWEC, Landfall HDD, and Onshore Interconnection Cable routes.	Figure 2.1.2.1 (now Figure 2.1-1 in the Final EIS) has been updated with details from the August 2022 COP.
Sunrise Wind submitted its OCS air permit application to EPA in August 2022.	The text in Section 3.4.1 in the Final EIS was updated to indicate that the OCS Air Permit Application has been submitted.
The PDE has been refined to include only 1 HDD exit. Further, this description of seafloor disturbance from the HDD exit should not be included in the Onshore Activities and Facilities as it is an offshore activity and should be moved to Section 3.5.2.5.1.2. Thus, the impact to benthic habitat and fauna from seafloor disturbance from onshore facilities should be negligible, not minor, since there is no seafloor disturbance associated with the onshore facilities (i.e., the ICW HDD).	The Final EIS has been updated based on the Aug 2022 COP, which says that an HDD exit pit may be located offshore (Section 4-217 to 218). Construction of the SRWEC–NYS Landfall would be accomplished with HDD methodology. HDD installation could involve the excavation of an HDD exit pit nearshore within the surveyed corridor. Seafloor disturbance from HDD exit pit excavation will encompass a small area of similar available benthic habitat in the region.
This cable separation at the HDD is no longer in the PDE, and reference to it should be removed.	Removed statement in Section 3.7.5.2.2.
This should be revised to state: “AC magnetic and induced electric- field levels were calculated to be 4.6 mG and 0.09 millivolts per meter (mV/m), decreasing to 0.1 mG and less than 0.01 mV/m or less at a horizontal distance of ±10 ft (3 m) from the cables. Where the SRWEC cables are	Section 3.7.5.2.2 was updated.

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buried together to a depth of 3.3 ft (1 m), the change in DC magnetic field from that of Earth's geomagnetic field would be +104 mG with induced electric fields (in an ocean current of 2 ft/sec [0.6 m/s]) of 0.37 mV/m."	
This text should be updated to reflect the latest design parameters from the August 2022 COP, as well as the results of the October 2022 SAV survey	The Final EIS characterized the eelgrass as potentially occurring in the Project Area, and notes that it was found in 2018, but has not been confirmed in a more recent survey (2022). Sunrise Wind has described pre-Project surveys for the area that would confirm or deny its presence prior to surface disturbance.
This paragraph should be updated to reflect the latest design parameters from the August 2022 COP, as well as the results of the October 2022 SAV survey.	The Final EIS characterized the eelgrass as potentially occurring in the Project Area, and notes that it was found in 2018, but has not been confirmed in a more recent survey (2022). Sunrise Wind has described pre-Project surveys for the area that would confirm or deny its presence prior to surface disturbance.
This paragraph should be updated to reflect the latest design parameters from the August 2022 COP, as well as the results of the October 2022 SAV survey.	The text was updated to reflect changes in the COP and text was added about the October 2022 survey and findings.
Some of the values do not align with the COP and should be updated to match the text on p 4-318 of the August 2022 COP: "...were calculated to be 4.6 mG and 0.09 mV/m, decreasing to 0.1 mG and <0.01 mV/m or less at a horizontal distance of ±10 ft (3 m) from the cables."	This was updated in Section 3.11.5.2.2.
Some of the values and text do not align with the COP and should be updated to reflect the August 2022 COP and the information in Appendix J1 submitted in August 2022. A suggested revision is provided below (text added is underlined): "Exponent Engineering, P.C. (2018) modeled anticipated DC and AC EMF levels generated by the DC SRWEC and AC IAC, respectively. It estimated the maximum induced magnetic field levels deviation from earth's natural DC magnetic field from the buried SRWEC at the seabed and peak loading to be approximately 392 mG, decreasing to approximately 43 mG within	This was updated in Section 3.11.5.2.2.

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10 ft (3m) of the cable. ranging from 13.7 to 76.6 mG on the bed surface above the buried and exposed SRWEC cable and 9.1 to 65.3 mG above the IAC. The DC magnetic field strength from the SRWEC would effectively decrease to 0 mG within 25 ft (7.6 m) of each cable. By comparison, the earth's natural magnetic field is more than five times the maximum potential EMF effect from the Project (Figure C-1, Appendix J; Sunrise Wind 2021j). The maximum AC magnetic field at peak loading at the seabed above the buried IAC was calculated to be 61 mG, decreasing to 0.3 mG within 10 feet of the cable."	
Some of the values do not align with the COP and should be updated to reflect the August 2022 COP and the information in Appendix J1 submitted in August 2022. Note that the SRWEC is up to 104.6 mi. It is not correct to say that cable could be unburied; rather, up to 15 percent of the IAC (27 mi) and up to 5 percent of the SRWEC (5.2 mi) could require secondary cable protection (including jointing, but not including cable crossings).	Values were updated based on the most recent COP submission.
The text should be updated to reflect the latest design parameters for the Temporary Landing Structure from the August 2022 COP, specifically Section 3.3.10.2 on page 3-88 of the August 2022 COP, and Table 4.4.1-5 on page 4-164 of the August 2022 COP.	Thank you for the comments, updates were made.
It should be noted that these plans were submitted as appendices to the August 2022 COP.	Thank you for the comments.
Section 3.2 of the Cultural Resources Avoidance, Minimization, and Mitigation Measures (COP Appendix Z) indicates that Sunrise Wind anticipates three to five borings may be collected.	Thank you for the comments.
Table 3.6.3-7 has different numbers than those presented in the COP (Table 4.7.1-9) and should be corrected.	Table 3.16-7 of the Final EIS (Previously Draft EIS Table 3.6.3-7), is equivalent to Table 4.7.1-10 of the COP. COP Table 4.7.1-9 presents housing values by state within the expanded region of interest. Table 4.7.1-10 presented additional details by counties

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	in the primary and expanded region of interest, and is the table utilized for the EIS.
Current-Dollar Gross Domestic Product by State for 2020 and 2021 Entity GDP (in millions of current dollars) was used in DEIS (table 3.6.3-8). The COP used 2018-2019 data (Table 4.7.1-2). The two tables should use the same data.	Table 3.16-8 in the Final EIS was updated with more recent, available data, which accounts for the difference between the numbers in the COP and the Draft EIS.
Figure 3.6.5-1 should be updated to include the Landfall HDD route and Temporary Landing Structure location depicted in the August 2022 COP.	Figure 3.18-1 (previously Figure 3.6.5-1 in the Draft EIS) has been updated to include the Landfall and HDD route and Temporary Landing Structure depicted in the most recent COP to reflect the most up to date proposal from Sunrise Wind.
Sunrise Wind suggests adding additional language to align with the PSMMP and ITA. E.g., "The PSO team will also have a PSO Project Manager who may work in the field or shore side for the duration of the mitigation activities to provide additional support to the Lead PSO and PSO team. The PSO Project Manager will also facilitate communication between PSOs and other shore side Project parties and provide administrative support to PSO in the field".	Although this level of detail is appropriate for the PSMMP, in terms of mitigation and monitoring, BOEM does not find it necessary to include this language in the requirements, although it may be approved in the final PSMMP following COP approval.
This measure in the ITA states "Activities with larger monitoring zones (>2 km) will use 25 x 150 mm…"	Table H-1 of Appendix H has been revised.
To align with the PSMMP document, Sunrise Wind suggests adding "vessel operators will monitor the Project's Situational Awareness System and as necessary, Whale Alert and the NARW RWSAS for the presence of NARWs once every 4-hour shift during Project-related activities".	Table H-1 of Appendix H has been revised.
Sunrise Wind suggests revising this language to match the most recently updated PSMMP to say: "All vessels will adhere to current NOAA vessel guidelines for approach distances and mandatory measures stipulated in regulations governing the approach to North Atlantic Right Whales and the Right Whale Speed Rule”.	It is not necessary to revise this language to match the most recently updated PSMMP. Minimum separation distances and vessel speed requirements are separate requirements and are not combined. Minimum separation distances proposed by BOEM apply to all vessels regardless of whether or not the approach is intention or not. It is consistent with current

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	approach regulations but removes interpretation that vessels must be approaching whales. BOEM has standardized this language and no change is required. Regarding seasonal management areas (SMAs), BOEM proposes to require all vessels follow the SMA speed restrictions regardless of vessel size. This change will not be made as it would restrict vessel speed restrictions to large vessel greater than or equal to 65 ft.
The PSMMP includes these extra details in the overall vessel strike avoidance policy section that should be added to the DEIS for both federal and state waters: "The mid-Atlantic SMAs specific to the Project Area include ports of New York/New Jersey and the entrance to the Delaware Bay in the vicinity of the Project Area. The same speed restriction will apply to vessels travelling 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".	Table H-1 of Appendix H has been revised.
All references to '12-hours' are incorrect and should be revised to say '24-hours' to ensure consistency between the PSMMP (Attachment 6).	Table H-1 of Appendix H has been revised.
Sunrise Wind suggests adding "Deployment of PAM systems will be outside the perimeter of the shutdown zone" to align with the PSMMP language.	Table H-1 of Appendix H has been revised.
Sunrise Wind suggests mentioning that long-term monitoring will be applied during O&M activities.	Language was added to this measure.
All mention of 'shutdown zones' in both the pre-start clearance and ramp-up section should be 'clearance zone' to align with both the ITA and PSMMP.	The pre-clearance and ramp-up section of Table H-1 of Appendix H has been revised.
It should be clarified that the PSMMP and ITA do not include monthly reporting to NMFS as is required within the DEIS reporting measures.	Table H-1 of Appendix H has been revised.
Both 'shutdown' and 'clearance zones' should be mentioned rather than	Table H-1 of Appendix H has been revised.

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just ‘shutdown zones’.	
All references to "shutdown zones" should be revised to say, "clearance zones".	Table H-1 of Appendix H has been revised.
It should be noted that the PSMMP does not include a ramp-up period for vibratory pile driving.	Table H-1 of Appendix H has been revised.
Sunrise Wind suggests adding additional language to align with the PSMMP for both federal and state waters: E.g., "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)".	Table H-1 of Appendix H has been revised.
There is an additional measure included within the HRG survey reporting section of the PSMMP that should be included here: "DMAs will be reported across all vessels".	Table H-1 of Appendix H has been revised.
The test should be clarified to say that two PSO-dedicated VFH radios are required.	Table H-1 of Appendix H has been revised.
This table should be updated to match the values included within the April 2022 PSMMP document. Within the updated table, both the pre-start clearance and Level B harassment zones are included.	Table H-1e in Table H-1 of Appendix H has been revised to include both the pre-start clearance and Level B harassment zones for the mitigation and monitoring zones associated with in-situ UXO/MEC detonation of binned charged weights, with a 10 dB noise attenuation system for the SRWF
The text should be revised to include additional measures included in the April 2022 PSMMP, including that 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).	Table H-1 of Appendix H has been revised.

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The table should be revised to incorporate additional language in the PSMMP, including: "Collect data on approximate source levels, the directionality of the sound produced, and transmission loss in at least one direction." and "The distance at which acoustic recorders are placed from the UXO detonation will be determined based on the modelled distances to Level A and Level B thresholds for the applicable UXO size being detonated".	Table H-1 of Appendix H has been revised.
To align with the language in the ITA, Sunrise Wind suggests adding: "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"	Table H-1 of Appendix H has been revised.
This measure is a bit contradictory to those required in the PSMMP: Base conditions: "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 SMA during NARW migratory and calving periods from November 1 to April 30" Standard plan: "Between November 1st and April 30th: 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 North Atlantic right whales. 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 Sunrise Wind Farm and Sunrise Wind Export Cable. Year Round: Vessels of all sizes will operate at 10 knots or less in any Dynamic Management Areas (DMAs)"	Table H-1 of Appendix H has been revised.

O.6. Responses to Other Agency, Stakeholder, and Public Comments on the Draft EIS

O.6.1. Proposed Action & Alternatives

Table O-10. Responses to Comments on the Proposed Action and Alternatives

Comment No.	Comment	Response
BOEM-2022-0071-0065-0015	Potential adverse impacts under the "No Action" alternative for several categories including moderate to major impacts for the fishing industry, minor to moderate impacts on finfish, invertebrates, and essential fish habitat, moderate impacts on marine mammals and sea turtles, and minor to moderate impacts for coastal habitats due to climate change. Minor to moderate impacts on air quality due to increased greenhouse gas emissions and air pollutants and minor to moderate impacts on water quality.	Thank you for your comment.
BOEM-2022-0071-0158-0006	Under No Action, compare to both scenarios, i.e., where all other wind projects are constructed and where no other projects are constructed.	Under the No Action Alternative, the SRWF would not be built, but the other wind farms that have already been approved or built would be considered the existing baseline. Considering cumulative impacts under the No Action Alternative, all proposed wind farms would be constructed in this scenario with the exception of the SRWF.
BOEM-2022-0071-0158-0010	The DEIS includes three alternatives, including two sub-alternatives for Alternative C. Alternative A is the no action alternative. Alternatives B and C use a uniform east-west and north-south facing grid of 1 x 1 nautical miles between wind turbines, as agreed to by multiple lease holders in the MA and MA-RI Wind Energy Areas.	As noted in Section 2.1.3.1 of the EIS, the specific 8 WTG positions that would be excluded from the identified priority areas are informed through the impact analyses described in Chapter 3. Section 3.5.2.6 and Figure 3.5.2-2 describe the analysis and indicate which 8 WTGs would

Comment No.	Comment	Response
	Alternative B is the proposed action as described in the COP and includes up to 94 wind turbine generators with a nameplate capacity of 11 MW, one offshore DC substation, and one DC export cable. This would result in a 1,034 MW facility. Up to 103 placement positions for turbines and the DC substation are available; it would be helpful to understand which of the eight turbine positions are likely to be dropped if the entire 1,034 MW facility was constructed.	be considered for removal.
BOEM-2022-0071-0158-0011	The DEIS only considers 11 MW based on the contract limitations described on page 2-40. We support consideration of a reasonable range of MW capacities, including higher MW turbines as this can reduce the footprint of the project, while still generating the same amount of power.	A range of WTG sizes was considered during the early development of the EIS and it was determined that 11 MW was most suitable for this Project. For more details on this, please see Table 2.2-1.
BOEM-2022-0071-0158-0012	Alternative C includes two sub-alternatives to reduce impacts to habitat and cod spawning. NMFS identified four priority areas from which they suggested removing turbines, ranked based on documented cod spawning activity, presence of large boulders, and proximity to Cox Ledge. We understand that they are presented in rank order, with Area 1 being highest priority for removal and Area 4 lower priority. We recommend providing further details in the FEIS on how these four priority areas were defined. We also recommend clarification of how future identification of additional cod spawning locations based on ongoing research could alter the turbine configuration.	NMFS's methods for prioritization are described in Section 2.1.3 and Section 3.7.6. Under Alternative C-3, the most up-to-date data from Atlantic cod surveys were considered in identifying the locations for WTG removal. Since Alternative C-1 and C-2 are no longer feasible due to glauconite sands, Alternatives C-1 and C-2 were not revised to consider this new data.

Comment No.	Comment	Response
BOEM-2022-0071-0158-0013	The specific locations proposed for removal under Alternatives C1 and C2 are not included in the alternatives section of the DEIS, but are included in Section 3.5.2.6, which describes the expected impacts of Alternative C1 on benthic resources. These details should also be included in the alternatives section. Alternatives C1 and C2 do not propose removing all turbines within the priority areas recommended by NMFS. The FEIS should explain why full removal of the NMFS highest priority areas wasn't considered.	Sections 3.5.2.6 and 3.5.2.7 present the analysis and results as requested by the NMFS. As stated in the EIS, NMFS priority areas, the highest boulder densities, and the maintenance of contiguous habitats informed how these alternative choices were developed.
BOEM-2022-0071-0158-0014	Alternative C1 would remove 8 turbine positions that are in or adjacent to known or likely areas of contiguous complex benthic habitat or cod spawning areas. In addition to these 8 turbine positions (87-94), we also recommend removing the positions labeled 95-96 to create a continuous area of complex habitat protected from development. Alternative C2 would identify additional turbine positions (beyond those removed in C1) that are in or adjacent to known or likely areas of Atlantic cod spawning and relocate these turbines to the eastern part of the lease area which was surveyed during 2022. Alternative C2 is more protective of habitat and cod spawning than C1, assuming that habitats in the eastern part of the lease, which had been less well studied at the time of COP development, are less complex and less likely to support cod spawning activity. The relationship between sub-options C-2a through C-2d (Figures 3.5.2-3 through 3.5.2-6) and priority areas should be explained, including why NMFS priority 1 area turbines weren't the first to be excluded under these	Thank you for your comment. Alternative C-1 and C-2 are no longer feasible due to glauconite sands. We appreciate your comments, but since these alternatives are no longer feasible, these changes in the wind turbine generator configuration will not be considered.

Comment No.	Comment	Response
	alternatives	
BOEM-2022-0071-0158-0015	Alternative C2 is described as being feasible subject to geological study and meeting the purpose and need. The developer should complete any necessary geological surveys prior to FEIS development so BOEM does not analyze an infeasible alternative from a geotechnical standpoint. It is not clear if the entire project area has been surveyed, the timing of geological sampling relative to the COP, and if there will be the same geotechnical challenges that arose in Empire Wind 1's project area, where some turbine locations and associated alternatives were determined to be infeasible following release of the COP. The COP appears to have been revised several times (August 2021, October 2021, and August 2022) and the timing of sampling and the geological sampling area are not well defined. This concern highlights the challenges with the environmental review process for offshore wind energy projects to date. Geophysical survey work (e.g., a full site assessment) should be completed before releasing a COP and before developing the DEIS in order to inform the alternatives and analyses. This can help ensure that all alternatives considered in the DEIS are technologically feasible.	Thank you for your comment. Prior to the Draft EIS development, the entire Lease Area was surveyed but not in full detail on the eastern side. BOEM requested the eastern side to be fully surveyed prior to Final EIS development to provide further details to analyze Alternative C-1 and C-2. During this timeframe, more geological sampling occurred within the Lease Area, revealing that some areas were not feasible for development due to glauconite sands. This prompted the development of Alternative C-3 since Alternative C-1 and C-2 are no longer technically feasible. BOEM is developing further guidelines for developers to avoid these issues in the future.
BOEM-2022-0071-0158-0016	For each alternative (B, C1, and C2), we recommend providing figures of the lease area, turbine placement positions, and cable routes relative to backscatter and boulder locations. Figure 3.5.2-1 only includes boulder densities within the lease area and backscatter data would be helpful to further delineate complex hard	Additional figures displaying backscatter and Atlantic cod data have been included in the Final EIS as part of the Alternative C-3 analysis.

Comment No.	Comment	Response
	bottom substrates. Furthermore, layering cod spawning aggregation data on such a figure would also be helpful in identifying certain areas of the lease to avoid or mitigation measures to reduce any impact (e.g., time of year restrictions for cod spawning).	
BOEM-2022-0071-0158-0017	The proposed action includes an AC to DC converter station with an associated cooling system. This is noteworthy from a fisheries perspective because the cooling system will entrain larvae, all of which are expected to experience mortality due to the high temperature effluent. Given this level of expected impact, we recommend including a rationale for the cooling station's location in the proposed action, which could also have an impact on heat dissolution. We also recommend evaluating whether a different cooling station location would result in fewer larval impacts.	Table 2.2-1 in the Draft EIS provides a discussion on the dismissed alternative that considered relocation of the OCS-DC.
BOEM-2022-0071-0158-0018	We support Alternative C2 with a focus on developing the easternmost portion of the lease in order to protect complex habitat and known cod spawning locations. As previously stated, further information is needed to fully understand which placement positions would be removed for each of these subalternatives individually and when combined. We recommend using NMFS priority areas to determine which turbine positions should be excluded from development to reduce the potential for negative impacts to fisheries and habitats.	The rationale for excluding certain WTG positions from development is provided in Sections 3.5.2.6 and 3.5.2.7 of the Final EIS.
BOEM-2022-0071-0158-0019	The DEIS and FEIS documents for this and other projects should evaluate a range of turbine MW sizes that are realistic for development. There are tradeoffs inherent in the selection of larger or smaller turbines. For	A range of WTG sizes was initially considered as an alternative but was ultimately dismissed. Please see Table 2.2-1 why this alternative was not analyzed in detail.

Comment No.	Comment	Response
	example, larger turbines will require larger impact hammers during installation, but the use of larger turbines will allow for fewer locations overall. Considering only 11 MW turbines in this DEIS precludes evaluation of tradeoffs.	
BOEM-2022-0071-0158-0020	Overall, the evidence and information provided should be consistent with impact determinations. For every analysis in the FEIS, we recommend including detailed information on the methods, caveats, and assumptions in order for stakeholders to understand and evaluate potential impacts and resulting avoidance, minimization, mitigation, and compensation measures. These comments apply to fisheries impacts as well as other impact analyses in the FEIS.	Appendix H, *Mitigation and Monitoring*, identifies all specific mitigation proposed for the Project, the anticipated enforcing agency for each proposed measure, and reporting requirements, where applicable. There is a discussion of the mitigation measures and how they would impact the preferred alternative. The Final EIS also presents a complete description and analysis of impacts from ongoing activities and trends (i.e., No Action Alternative) and impacts from the Proposed Action and alternatives.
BOEM-2022-0071-0198-0003	In identifying potential port facilities that could support construction or O&M for the project, Sunrise Wind failed to recognize New Bedford's second terminal dedicated to offshore wind. The New Bedford Foss Marine Terminal is a private venture that will add another base of operations and terminal logistics facility to support offshore wind projects off Massachusetts and the northeastern coast seaboard. The 30-acre site will undergo redevelopment this year and will provide storage and laydown yards for equipment and materials, berth facilities for tug and barge operations, and host crew transfer vessel (CTV) and service operation vessel (SOV) support services. It will create new office space for project teams and a marine coordination center for technicians involved in offshore wind projects.	At this time, Sunrise Wind has no plans to use the New Bedford Foss Marine Terminal as a port. The Port of New York-New Jersey, NY, New Bedford Marine Commerce Terminal, MA, Sparrows Point, MD, Paulsboro Marine Terminal, and/or Port of Norfolk, VA are considered back up and/or support facilities in the COP PDE. The use of these ports will depend upon contract signing and vessel availability, home port locations of vessels, supply chain logistics, emergency or storm refuge, and/or additional unforeseen circumstances.

Comment No.	Comment	Response
	We encourage BOEM and Sunrise Wind to extensively review both this site, as well as the New Bedford Marine Commerce Terminal and other current and future facilities within the Port of New Bedford, for a location for construction, assembly and fabrication, as well as future O&M activities. Both sites are well positioned geographically and provide extensive shoreside support.	
BOEM-2022-0071-0232-0004	With respect to the DEIS's discussion of alternatives, BOEM must examine alternatives that also help meet NY's clean energy goals. Without meaningful alternatives, the document becomes meaningless and capricious. The comparison should include an alternative that avoids complex hard-bottom habitat and other renewable energy options such as small-scale nuclear and solar. Without such alternatives, the DEIS does not offer a meaningful analysis.	Thank you for your comment. Alternatives C-1, C-2, and C-3 identified complex hard bottom habitat for avoidance of development. Alternatives that analyze small-scale nuclear and solar is not within the scope of this Project and would not be appropriate to analyze within this EIS.
BOEM-2022-0071-0232-0007	The DEIS fails to examine the direct, indirect, and cumulative impacts of Sunrise Wind on individual species in light of the species' particular conservation statuses. Without this species-by-species analysis, the DEIS cannot meaningfully consider the effects of Sunrise Wind on the marine environment. BOEM must go back and actually examine the impacts of the wind farm on a species-by-species basis using the most up-to-date models and telemetry data. BOEM must also be transparent about uncertainties and gaps in the data and adopt a precautionary approach where endangered and protected species are at risk.	Analysis of species that may be impacted by the Project are summarized in Chapter 3. Data used is most current and updated. Additionally, all federally and state-listed species are analyzed in detail during their respective consultation processes under the appropriate federal or state regulations.

Comment No.	Comment	Response
BOEM-2022-0071-0232-0009	BOEM minimizes the impacts of the project on marine life, birds, and bats by insisting that other habitats are available elsewhere; however, this does not account for the fact that many species affected by Sunrise Wind exhibit high site fidelity and as a result, may be less likely to simply move elsewhere. It also fails to account for the cumulative impact of the other projects in the lease area and how interactions between stressors might preclude the species from utilizing the "replacement" habitat. BOEM must fully examine the impacts on wildlife that will occur from the loss of habitat, particularly on those species that exhibit high site fidelity, exhibit the location and availability of alternate habitats, and offer concrete evidence to support its assumptions that the impacts will be "minor" due to the existence of other suitable habitats.	Site fidelity was considered in Chapter 3 and is included in the cumulative analysis. For birds and bats, the areas of potential displacement are minimized through the use of easements and rights-of-ways, areas already subject to disturbance. Newly disturbed upland and coastal areas are very small. We are unaware of any bird or bat species that exhibit such specific site fidelity that would compromise their ability to return to an area within a couple hundred feet of a potentially disturbed or removed habitat. Potential impacts on marine mammals and sea turtles are considered in Section 3.11 and Section 3.12, respectively.
BOEM-2022-0071-0232-0027	The Executive order 14008 dictates the need for the projects to maintain biodiversity. The World Health Organization affirms that biodiversity loss poses a greater risk to human health than climate change alone (Patil, 2017). The mortality risk to endangered species, the introduction of invasive organisms, and the degradation of the coastal habitat from the project will all contribute to a reduction of biodiversity. Wind energy has documented risks to biodiversity (Voigt, 2019). Given the health consequences of biodiversity loss, expansive wind farm installations could violate the internationally recognized Human Right to Health (UN, 2000) as well as the mandate from the executive order. The US government has an obligation under	Thank you for your comment. Risks to biodiversity are analyzed in the Chapter 3 analysis. Biodiversity is preserved by maintaining the integrity of each individual species. No sea turtle or marine mammal species are anticipated to be at risk of extinction or major impacts from the proposed action. Under Alternative C-3, by siting the WTGs away from the more diverse complex habitats, the SRWF would minimize impacts to these more diverse communities. The Climate Resiliency Executive Order (EO) referenced falls under climate change. Biodiversity/climate change are addressed under Coastal Habitats, along with the anticipated preservation of biodiversity via reducing the use of oil and therefore reducing the impacts of climate change.

Comment No.	Comment	Response
	international human rights law to protect biodiversity as an important factor in human health (Hamley, 2022). The BOEM DEIS does not incorporate the latest scientific findings from the North Sea on biodiversity loss, nor does it address the relationship between biodiversity loss and human health. BOEM cannot afford to ignore biodiversity loss in evaluating the cost-benefit analysis of offshore wind farm development.	This is addressed in Sections 3.9.1, 3.9.2, 3.9.3, and 3.9.5.
BOEM-2022-0071-0242-0014	Critical to a proper cumulative impact analysis is its scope. It is important that the reasonably foreseeable impacts BOEM has chosen to assess be examined on the proper temporal and spatial scope to ensure that cumulative effects are fully evaluated. In addition to details provided in the sections below, we urge BOEM to ensure that, in evaluating impacts to species, the agency considers potential changes in range and seasonal use due to various anticipated levels of warming and climate change.	The EIS addresses changes in current species range due to climate change based on available literature. In Section 3.7.3 and 3.7.5 (Benthic Resources) changes in current species range due to climate change effects was discussed in reference to Pinsky et al. (2020). The potential impacts of range and seasonal use shifts for marine mammals, sea turtles, birds, and bats were also considered within their respective sections.
BOEM-2022-0071-0248-0012	Both DEISs should explicitly include alternatives for analysis that serve to mitigate the project's impacts to fishing, including the specific requests above, those raised during scoping and in previous comment letters, and those listed on RODA's website. The Sunrise DEIS includes alternatives intended to minimize impacts to fisheries habitats. The CVOW DEIS includes alternatives designed to accommodate fish haven and navigation as well as one accommodating sand ridge habitat. While inclusion of these alternatives is appreciated, and we agree minimizing impacts to important habitat features is important; these do very little to protect the	BOEM's regulations require BOEM to analyze Sunrise Wind's proposal to build a commercial-scale wind energy facility on the Renewable Energy Lease Number OCS-A 0487. The purpose and need in the EIS reflect the requirement per those regulations, whereas BOEM's purpose as stated in Section 1.2 is to determine whether to approve, approve with modifications or disapprove Sunrise Wind's COP, is needed to fulfill BOEM's duties under the lease. As part of the NEPA process, alternatives were considered and screened if it was outside the jurisdiction of the lead agency. Mitigation and monitoring measures identified for consideration in

Comment No.	Comment	Response
	dependent recreational and commercial fishing communities. We recommend other habitat features important to fisheries in the lease area be afforded similar protection as well. This would ensure that disruptions to our nation's food security is minimized and reduce the potential for negative impacts to shoreside business dependent upon the seafood harvested in the lease area. The nation's seafood supply is dependent upon our harvesters and shoreside support businesses. Each of these depends on the other. If harvesters are unable to keep product coming across the docks, the buyers and processors are directly impacted. If a processor is forced to close their doors, the harvesters have no place to sell their catch, and they will likely lose access to shoreside infrastructure necessary for their operations (ice houses, offloading equipment, etc). When analyzing potential impacts to commercial fishing under any of the alternatives proposed, the analysis necessarily needs to consider potential impacts to, and mitigation measures for, those shoreside businesses as well. BOEM's practice to date has been to incorporate mitigation measures under consideration as appendices or Record of Decision conditions rather than analyzing them fully as alternatives.	the EIS are summarized at the end of each resource area. Appendix H Mitigation and Monitoring further describes the APMs committed to by the developer in the COP, additional mitigation and monitoring measures being considered by BOEM, and mitigation measures required through consultation with cooperating agencies.
BOEM-2022-0071-0249-0036	Moreover, for Section 110(f) purposes, it is not appropriate for BOEM to default always to Sunrise Wind's preferred alternative in the Draft Environmental Impact Statement, ruling out all other minimization alternatives—as well as other avoidance and minimization measures—because they do not fit with	Thank you for your comment. No preferred alternative has been chosen in the Final EIS and BOEM will not default to Sunrise Wind's Preferred Alternative. BOEM is continuing to consult with the National Park Service (NPS) and other consulting parties on the mitigation measures for adversely affected properties and

Comment No.	Comment	Response
	Sunrise Wind's self-serving purpose and need. Likewise, BOEM's apparent decision that Sunrise Wind will not significantly affect our clients' NHLs' historic integrity fails to consider their inseparable connection to the Atlantic Ocean or the special sensitivity that those who value NHLs have to integrity losses. Section 110(f) demands a heightened level of scrutiny that BOEM has not yet met.	continues to fulfill the requirements of Section 110(f).

O.6.2. Air Quality

Table O-11. Responses to Comments on Air Quality

Comment No.	Comment	Response
BOEM-2022-0071-0232-0012	The DEIS indicates that significant amounts of SF6 will be housed in the turbines and substations and that SF6 leaks during operations. Given that every molecule of SF6 contributes 23,500 x more than CO2 to greenhouse warming, and Scottland's disastrous leak of SF6 (Mavrokefaledis, 2022), we should not tolerate the risk of contributing to GHG emissions in our effort to mitigate climate change. BOEM should insist that the developer eliminate all components with SF6 (turbines and substations).	Thank you for the comment. There will be no SF6 used with the turbines. Sunrise Wind has evaluated the feasibility of SF6-free designs for the OCS-DC and those options are currently not technically feasible. The current APMs for the Project include the use of completely sealed switchgears equipped with integral low-pressure detectors to detect a leak, in the unlikely event one were to occur. The switchgears have a manufacturer-certified leak rate of less than 0.5 percent per year, which is in compliance with EPA and Massachusetts guidelines.
BOEM-2022-0071-0205-0022	The FEIS should be sure to detail all information related to air and water quality associated with manufacturing, port activities, construction, and ongoing operations and maintenance of the Project.	Thank you for the comment. Information related to air and water quality associated with port activities, construction, and O&M is provided in the Final EIS. Information related to manufacturing is not available.

O.6.3. Bats

Table O-12. Responses to Comments on Bats

Comment No.	Comment	Response
BOEM-2022-0071-0232-0028	Wind turbines kill more bats than previously recognized (Voigt, 2022), particularly during the autumn migratory season. One bat species native to Rhode Island, the northern long-eared bat, was recently listed as endangered and thus, is now protected under the Endangered Species Act. Moreover, bats control insect populations. One brown bat can eat 1000 mosquitos per night. Decreasing bat numbers will allow mosquito populations to rise, thereby increasing the prevalence of mosquito-borne diseases, including Zika (Elrefaey, 2021), West Nile (Ferraguti, 2021), and Eastern Equine Encephalitis (Armstrong, 2022) viruses. At a time when nations have pledged to decrease pesticides (Einhorn, 2022), we cannot allow wind farm developments to reduce bat populations. The BOEM does not adequately incorporate the latest scientific findings that recognize the true bat mortality associated with wind farms, nor does it address the public health consequences of decreasing bat populations, the spread of mosquito-borne illnesses, and the subsequent rise in insecticide use this will promote.	The most recent literature and data were used to prepare a separate Biological Assessment for USFWS Section 7 consultation under the ESA for listed bat species. Based on a review of all relevant literature, our conclusion remains the same.
BOEM-2022-0071-0242-0010	Consult with the U.S. Fish and Wildlife Service about potential offshore collision impacts to the northern long-eared bat, which was recently reclassified as endangered;	Thank you for your comment. This information is contained within the USFWS Biological Assessment in consultation with the USFWS.
BOEM-2022-0071-0242-0054	Little data exist on bats' use of the offshore environment and their interactions with offshore WTGs, although research at land-based wind facilities reveals that bat fatalities are common, with the potential for cumulative impacts to cause population-level declines. Because all bats in the Project Area have documented collisions with land-based wind energy facilities and significant uncertainties exist around bats' use of	Acoustic data has been collected in the region and for offshore wind projects. Acoustic data indicates low bat usage offshore. Mitigation and monitoring measures will be implemented for this Project, and BOEM recently completed a

Comment No.	Comment	Response
	the offshore environment, BOEM should not interpret a lack of data as a lack of impacts and instead work with Sunrise Wind, the RWSC, and other developers to implement monitoring regimes to enable better understanding of bat impacts from offshore wind development.	Section 7 consultation with USFWS for ESA-listed and proposed bird and bat species and concurred with BOEM's determination that the Proposed Action is not likely to adversely affect northern long-eared bats or tricolored bats but did not evaluate the potential for effects to little brown bats. A description of the presence of northern long-eared bats, little brown bats, and tricolor bats has been added to the description of the affected environment section of the bats section.
BOEM-2022-0071-0242-0055	As discussed above, assessing cumulative effects is essential to understanding impacts and this is particularly important for bats, where the best available scientific information indicates that cumulative impacts from land-based wind energy have the potential to cause significant population-level declines. Sunrise Wind's DEIS states that the Proposed Action and other reasonably foreseeable projects will result in negligible or minor adverse cumulative impacts to bats but insufficient research is provided to support this claim, especially given the issues discussed below with the project-level impact analysis for bats. Of particular concern for the accuracy of BOEM's cumulative impact analysis for bats is the geographic analysis area. BOEM defined the geographic analysis area as 100 mi offshore and 0.5 mi inland, the smallest geographic analysis area used for any U.S. offshore wind project thus far. This is at odds with the geographic analysis area used for bats for Vineyard Wind 1, where the area extended 100 mi inland. BOEM presents no research in the DEIS to support the assumption that bats found offshore exclusively use very near-coast habitat on land (i.e.,	Geographic analysis is based on the geographic extent of potential Project impacts, either direct or interdependent or interrelated activities/effects, rather than the entire range of species that overlap with Project areas. The inclusion of all areas where individuals who may cross Project areas would quickly result in impractically large areas to incorporate into the geographic analysis (e.g., monarch butterflies, humpback whales, blue whale, and roseate terns). The analysis of potential impacts to bat species will be updated with additional information that was included in the Biological Assessment developed for ESA consultation with USFWS for listed bat species.

Comment No.	Comment	Response
	half a mile or less from the coasts) to support this limited geographic scope. A survey of available research on bat migration does not support BOEM's rationale for their limited inland geographic analysis area in Sunrise Wind's DEIS. Although the migratory movements of bats, especially migratory tree bats, are poorly understood, many species of bats—both long-distance migrants like migratory tree bats but also cave bats—are capable of flights in excess of 100 km (62 mi), indicating that bats found offshore in wind development areas could also be found significant distances inland. Research from Canada found that 20 percent of little brown bat movements exceeded 500 km (311 mi), which is further supported by data from tracked little brown bats, which shows individuals using both coastal areas and making long-distance flights to locations significantly further inland than 0.5 mi. Hoary bats, which are capable of long distance flights over water, have been recorded traveling over 1,000 km (621 mi) and are thought capable of migrations in excess of 2,000 km (1243 mi). Furthermore, in addition to little brown bats, data in Motus tracks movements of individual silver-haired bats, eastern red bats, hoary bats, eastern small-footed bats, and Indiana bats from coastal areas on the east coast to areas in excess of 100 mi inland. These movements do not support a geographic analysis area that extends only 0.5 mi inland but rather suggest that bats exposed to offshore wind energy projects could be found far inland (and therefore exposed to land-based wind energy facilities) and that a geographic analysis area that extends 100 mi inland would be more appropriate. BOEM should conduct a thorough review of the literature on bat migration and radio- and GPS-tagged bats and select a boundary that	

Comment No.	Comment	Response
	better reflects the potential habitat use of exposed bats. This revised boundary will likely require an updated analysis to reflect that bats exposed to offshore wind projects could not only be exposed to multiple offshore wind facilities but also be exposed to land-based wind energy projects.	
BOEM-2022-0071-0242-0056	The DEIS and COP point to low bat detections (despite low survey effort) in the offshore environment and the offshore Project Area to support a finding of negligible impacts on bats. The data analyzed to support this are acoustic data collected in the offshore environment in the absence of offshore wind turbine structures. These data are unlikely to reflect bats' use of the offshore Project Area once turbines are constructed due to bats' attraction to wind turbines. Although the DEIS and COP seem to acknowledge this—noting that "visible structures on a previously flat, unusable landscape may provide potential roosting opportunities" and that "[o]ffshore structures may attract bats or serve as concentration points"—the analyses do not seem to account for the potential increased collision risk associated with attraction. Given the addition of structures post-construction and bats' known attraction to structures, including wind turbines, basing post-construction impact analyses on preconstruction acoustic data is inappropriate. At land-based wind facilities, pre-construction bat activity does not correlate with post-construction fatalities, likely due to bats' attraction to turbine structures. Furthermore, recent research at buoys, vessels, and the two Dominion wind turbines off the Virginia coast found considerable differences in bat activity in the presence of turbines as compared to open water. This once again underscores that BOEM should not draw conclusions about Sunrise Wind's impacts on bats based on sparse offshore acoustic data collected over open water.	Thank you for your comment. BOEM has engaged with USFWS for a Section 7 consultation regarding listed and proposed bird and bat species.

Comment No.	Comment	Response
	Although the COP and DEIS acknowledge bats' attractions to wind turbines, this attraction is not clearly factored into the impact analyses as to how it could increase collision risk. In fact, the COP and DEIS explicitly state that the wide spacing of the turbines in the offshore environment may allow bats "to avoid operating WTGs and minimize risk of potential collision." This assertion is starkly at odds with the best available scientific information on bats and wind turbines which indicates that bats will change course not to avoid, but to approach wind turbines. BOEM must consider the potential that bats could be attracted to offshore wind turbines—which would dramatically increase collision risk—and update the impact assessment accordingly.	
BOEM-2022-0071-0242-0057	A lack of data on offshore movements of cave-hibernating bats, such as Myotis bats, including the newly endangered northern long-eared bat, does not imply a lack of impacts. Despite acknowledging that there is uncertainty around movements and behaviors of bats offshore, the COP and DEIS nevertheless conclude that cave-hibernating Myotis bats, including the now-endangered northern longeared bat, "do not typically occur on the OCS" and that their offshore movements are "rare[.]" However, cave-hibernating bats may be found offshore more frequently and at greater distance than the assessments in the COP and DEIS indicate. Acoustic survey efforts in the Mid-Atlantic identified Myotis calls at 63 percent of sites surveyed, and Myotis species were present at 89 percent of sites surveyed across the Gulf of Maine, Mid-Atlantic, and Great Lakes.	Additional analysis and references from the Section 7 consultation with USFWS were added to Section 3.6.5.3.
BOEM-2022-0071-0242-0058	Although the DEIS and COP both state that the federally endangered Indiana bat is not known to occur in the area, a tagged Indiana bat was detected just north of the Project Area, as discussed in Section III.I.3 of our scoping comments. We refer BOEM back to those scoping comments.	A singular detection is generally considered extralimital until there is additional corroborating information. Upon further research following this comment, no other information indicated detections of Indiana bats in the action area.

Comment No.	Comment	Response
BOEM-2022-0071-0242-0059	Although endangered northern long-eared bats are present near the cable landing, on Block Island, on Long Island (including Fire Island National Seashore), and on Martha's Vineyard, collision impacts are largely dismissed as low risk. This conclusion relies on a lack of acoustic detections offshore, coupled with a small study in which five tracked northern long-eared bats did not make offshore movements. While limited offshore movement data exist for bats, the presence of northern long-eared bats on both Martha's Vineyard and Nantucket indicates that this species can cross open water and the species has been tracked making long distance flights over water in the Gulf of Maine. Moreover, as noted within the COP and DEIS, a northern long-eared bat was acoustically detected near Sunrise Wind's Project Area, 34 km offshore around South Fork Wind Farm. Furthermore, the lack of confirmed acoustic calls from northern long-eared bats in some offshore wind surveys does not necessarily support that northern long-eared bats would not be found in the offshore Project Area. There were 157 bat calls detected in the surveys that were not identified to species and therefore could have been produced by northern long-eared bats. Given the potential for the species to use the offshore environment, the detection of a northern longeared bat during South Fork surveys, and the lack of survey efforts to provide evidence of absence, BOEM should not consider exposure and risk to northern long-eared bats and other cave bats to be negligible. Instead, BOEM should consult with the U.S. Fish and Wildlife Service on potential impacts and require Sunrise Wind to conduct or support monitoring to better understand the potential presence of and collision risk to northern long-eared bats in the offshore Project Area.	BOEM has engaged with USFWS for a Section 7 consultation regarding listed and proposed bird and bat species. The consultation used the best available data, and that analysis was carried forward into the Final EIS.

Comment No.	Comment	Response
BOEM-2022-0071-0242-0060	Because of the significant data gaps that preclude meaningful impact analyses for bats and offshore wind development, robust monitoring, especially post-construction monitoring, will be critical to better understanding potential impacts to bats from Sunrise Wind's operations. As new technologies become available for monitoring impacts at offshore wind facilities, such as strike detection technology, BOEM should require Sunrise Wind to commit to deploying these and, if monitoring reveals that impacts to bats are non-negligible, BOEM should require Sunrise Wind to employ minimization strategies and deterrent technologies.	The Avian and Bat Post-Construction Monitoring Framework is included as an attachment to COP Appendix P2 (Goodale et al. 2022) and is publicly available on BOEM's website. Additional mitigation and monitoring measures may arise from consultations and coordination with federal and state resource agencies. These additional monitoring requirements would be considered by decision-makers and incorporated into the terms and conditions for COP approval.

O.6.4. Benthic Resources

Table O-13. Responses to Comments on Benthic Resources

Comment No.	Comment	Response
BOEM-2022-0071-0002	Ecological design elements should be incorporated into the offshore wind infrastructure, specifically for scour and cable protection where benthic habitat could be maximized. Using nature-based design elements significantly increases species settlement, richness, and abundance. Nature-based design elements allow the structure to actively provide carbon sequestration, decrease the magnitude and frequency of maintenance leading to increased structural lifespan. Using ecological concrete as a mitigation measure and design alternative supports compliance with strict environmental regulations. The term “ecological concrete" is an alternative to traditional concrete that enhances or encourages the growth of flora or fauna when placed in a marine environment. Ecological concrete may include recycled materials, such as recycled or reclaimed concrete, resulting in reduced greenhouse gas emissions compared to traditional concrete. The DEIS specified that “Rock berm or concrete mattress separation layers would be installed prior to cable installation, while the rock berm or concrete mattress cover layers would be installed after cable installation. Any rock berm separation and cover layers would be installed using suitably approved rock material. The rock 2-17 berm separation and cover layers are defined by minimum geometry and vertical and horizontal tolerances. The amount of cable protection would be as required for suitable coverage and technical agreements with respective asset owners. It is assumed up to 1.48 acres	Thank you for your comment. BOEM has not identified a preferred or required form of scour protection in the Final EIS; however, BOEM's proposed mitigation measures outlined in Appendix H includes certain requirements or limitation to the types of cable protection that should be used. These requirements are consistent with BOEM's Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR Part 585, which states, "If needed, 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 obstructions for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered or 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." Mitigation resulting from BOEM's Magnuson-Stevens Fishery Conservation and Management Act consultation has also been incorporated into the Final EIS.

Comment No.	Comment	Response
	(0.6 ha) of cable protection would be required per crossing. The cable protection required for cable crossings is in addition to the secondary cable protection requirements previously described…Scour protection, if required, would cover the entire jacket footprint, extending an additional 33 to 66 ft (10 to 20 m) beyond the base of the structure and reaching a height of approximately 6.5 ft (2 m) from original seabed level. Additional CPS stabilization may be used where the IAC and SRWEC would be pulled into the foundation, which would require additional rock cover on top of the scour 2-18 protection. This additional rock cover would have a height of approximately 6.5 ft (2 m), for a total of up to 13.1 ft (4 m) height from the original seabed level, inclusive of the scour protection and CPS stabilization." Given the aforementioned details above, all concrete materials should solely be fabricated from ecological concrete, including all cable and scour protection, in order to minimize impacts and create marine habitat opportunities. Using ecological concrete scour protection would offer the same structural benefits, with a smaller fill material footprint. Furthermore, the species that settle and grow on the ecological concrete mattress and cable protection would create a living layer providing bioprotection which hardens the structure. In a recent technical report, The Nature Conservancy (TNC) recommended nature-based designs for cable protection and scour protection. Ecological concrete technology is also featured in the Wind Energy Monitoring & Mitigation Technologies Tool developed by the International Energy Agency Wind Task 34 (WREN), the Pacific Northwest National Laboratory, and the National Renewable Energy	

Comment No.	Comment	Response
	Laboratory.	
BOEM-2022-0071-0158-0032	The DEIS suggests that hydrodynamic effects and disturbances on benthic resources will result from the project; however, we are concerned that their extent may be underestimated. For example, the presence of structures could impact the Mid-Atlantic Cold Pool, causing changes in temperature, mixing, larval transport of important commercial and recreational fish species (e.g., sea scallops), and temperature corridors used for migration for multiple important fishery species. This is an area of ongoing research. The FEIS should clearly document what is known about potential impacts to the Cold Pool and resulting potential impacts to marine species and fisheries. The FEIS should acknowledge data gaps and ongoing research and should fully consider potential impacts resulting from this project, as well as cumulative impacts from all planned wind energy projects throughout the region.	Information on the Cold Pool was added under Section 3.7.3, *Presence of Structures*.
BOEM-2022-0071-0158-0033	The Councils are concerned about the impacts of boulder removals required for cable installation, especially when done via plow, which is the proposed method in combination with boulder grabs (page 3-420). We recommend using grabs to relocate boulders given plowing will have a much larger impact on benthic habitats than grabs. The FEIS should specify plow width and the size of the area that will be impacted. The nature of this impact is very different from dredging used to harvest seafood, and the scientific literature on fishing gear impacts is unlikely to provide a reasonable proxy for the impacts of boulder clearance plows. For example, fishermen attempt to avoid boulders to reduce the risk of costly damage to fishing gear,	A towed plow was proposed for installation of the cable and IAC within the SRWEC but is no longer under consideration. Other boulder removal and relocation methods proposed include using boulder grab from a Dynamic Positioning (DP) offshore support vessel (See Figure 3.3.3-5 in the September 2023 COP). The COP includes an assumption that up to 5 percent of the SRWEC-OCS, up to 30 percent of the SRWEC-NYS, and up to 10 percent of the IAC may require boulder clearance within a 30 m (98 ft) wide corridor, and that boulders would be removed from a 220-m (722-ft) radius area around each WTG and OCS-DC foundation. Sunrise Wind plans to relocate boulders that are within the designated

Comment No.	Comment	Response
	and the penetration depth of fishing gear is much less than a boulder clearance plow.	boulder relocation area to the nearest point outside of the boulder relocation area to minimize the distance and disturbance to attached fauna.
BOEM-2022-0071-0158-0037	The DEIS states that "burial of the proposed SRWEC would typically target a depth of 3 to 7 ft… BOEM guidance is that all static cables be buried at the depth of 6 ft below the seabed where technically feasible" (page 2-15). The Councils have not endorsed a specific burial depth, but rather have recommended depths that are adequate "to reduce conflicts with other ocean uses, including fishing operations and fishery surveys, and to minimize effects of heat and electromagnetic field emissions" (from the BOEM Draft Fisheries Mitigation Guidance). Assuming a depth of 6 feet is sufficient to address these objectives, we recommend the FEIS include this target burial depth as the minimum end of the range.	The target cable burial depth is 6 ft (1.8 m), per BOEM guidance (see BOEM's Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf; Pursuant to 30 *CFR* Part 585, dated June 23, 2022); however, this depth may not always be suitable which is why there is a range for burial depth. Based on the September 2023 COP, the depth ranged change from 3 to 7 ft (0.9 to 2.1 m) to 4 to 6 ft (1.2 to 1.8 m).
BOEM-2022-0071-0205-0024	BOEM should ensure that the project developer has conducted appropriate benthic surveys and obtained samples for all cable routes and other activities that may be impacted by existing contamination from urban and storm runoff, industry, or historic use of the site.	Thank you for your comment. The developer has followed appropriate surveys for construction.
BOEM-2022-0071-0232-0015	Invasive species on the monopiles can decrease water oxygenation levels, as demonstrated in the North Sea (Daewel, 2022). Deoxygenation can cause fish die-offs and harmful algal blooms. The North Sea has experienced an increase in harmful and costly algal blooms in recent years. The timing coincides with offshore wind installations. Harmful algal blooms carry an approximate financial burden to the economy of over $8 billion per year (Brown, 2019). A toxic algal bloom caused an unusual and "catastrophic" die-	Respectfully, the article cited does not discuss invasive species (Daewel et al. 2022). It focuses on the changes in factors that affect primary productivity such as an increase in light penetration due to reduced mixing and increased sedimentation near WTGs. The article does note that some bottom areas would see reduced oxygen levels, again due to reduced mixing or more shallow mixed layers. The sediments modeled contain large amounts of carbon, which would be sequestered on the

Comment No.	Comment	Response
	off of crabs and lobsters in the late fall/early winter of 2021 along England's North Sea coast (Beament, 2022), soon after the construction of the largest offshore wind farm in the world, Hornsea 1 and 2. Similarly, in the year after the Block Island wind farm construction, a harmful algal bloom contaminated shellfish in Narragansett Bay with the deadly neurotoxin, domoic acid. Changes in nutrient levels correlated with toxicity (Sterling, 2022). Although an association with the Block Island Wind Farm was not considered, the timing and geographic pattern of the bloom suggest invasive filter feeders on the "artificial reefs" of the wind farm may have diminished the nutrients and prompted this harmful bloom. As a result of harmful algal blooms, this project may violate the Seafood Safety Regulations (21 C.F.R. § 123). BOEM does not adequately consider the cost, both financial and from a public health concern, of the project's propensity to induce harmful algal blooms.	bottom. It also notes that areas with strong stratification, like the area near the SRWF, would see less of an effect. See also text excerpted from the Revolution Wind EIS which discusses this in more detail. (See Rev Wind EIS pg. 3.6-31). "Collectively, these findings indicate that planned and probable future wind farm development on the Mid-Atlantic OCS are unlikely to produce hydrodynamic effects on the order of those associated with European wind farm development in the southern North Sea (e.g., Christiansen et al. 2022; Daewel et al. n.d. [2023]; Dorell et al. 2022)." This topic is addressed in Section 3.7.5.2.2 under a discussion of the presence of structures. Algal blooms tend to be in response to increases in nutrients (eutrophication) and are exacerbated by warming ocean temperatures. There is much evidence for the causality of coastal algal blooms due to increased ocean temperatures. We discuss how the WTGs may affect ocean thermal patterns (cold pool) in the EIS.
BOEM-2022-0071-0242-0068	The Draft EIS classifies the substrate types as one of three benthic habitat groups: (1) large-grain complex habitats; (2) complex habitats; and (3) soft-bottom habitats. According to the Draft EIS's classification system, large-grain complex habitats are areas where large boulders are present. Complex habitat comprises a diversity of habitat types, including areas with sediments greater than five percent gravel of any size, as well as shell substrate. Finally, soft-bottom benthic habitats consist of silt, sand, and mud substrate. In the area of the Sunrise Wind Farm and SRWEC,	Thank you for your comment. Cox Ledge was a consideration when determining the alternatives for the reasons you have pointed out. Figure 2.1-6 displays the location of Cox Ledge in relation to the SRWF. Surveys have determined that Cox Ledge is approximately 5 to 10 km (3.1 to 6.2 mi) north of Priority Area 1, which is the area closest to the ledge terminus. Each portion of the benthic habitat surveyed is described in Sections 3.7.1.1 through 3.7.1.7. Table 3.7-1 summarizes the sampling results including dominant substrate and

Comment No.	Comment	Response
	sand and mud are the predominant substrate types; however, the northwestern portion of the Project Area contains areas where gravel and boulder substrates are predominant. The Sunrise Wind Farm is in the vicinity of and overlaps Cox Ledge, an area of complex benthic habitat. In general, complex, hard bottom habitat, like Cox Ledge, provides EFH for a number of species, including both juvenile and adult Atlantic cod. Offshore, both juvenile and adult cod prefer structurally complex hard bottom habitats comprising mostly pebbles, cobble, and boulders. Cobble substrate is critical for the survival of juvenile cod because it helps them avoid predators. Studies have also shown that hard bottom habitats are important for cod reproduction. Atlantic cod demonstrate spawning site fidelity, meaning they return to the same bathymetric locations year-after-year to spawn. Boulders and cobbles, which are more prevalent in complex habitats, also provide EFH for other species such as black sea bass juveniles and adults, Atlantic sea scallop larvae, ocean pout and herring eggs, as well as certain invertebrates that attach to hard surfaces, including mussels, oysters, starfish, sea urchin, etc. Cox Ledge is an area of concern for fishery managers because it provides important habitat for several commercially and recreationally important species–notably, spawning habitat for Atlantic cod. Atlantic cod populations are now severely depleted and rebuilding overfished cod	common taxa observed to further characterize the types of habitats surveyed within each Project component area.

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	populations hinges on access to healthy spawning habitat and successful spawning events. The spawning cod stock in and around Cox Ledge is especially important because it is a reproductively isolated cod spawning stock.	
BOEM-2022-0071-0242-0069	In several instances, the Draft EIS observes that the presence of WTG structures, anchoring, and cable emplacement can result in long-term impacts to benthic habitats and EFH. For example, the Draft EIS explains that while anchoring and mooring activities are generally expected to be localized and short-term, they can be long-term if they occur in eelgrass beds or hard-bottom habitats. It further states that the presence of WTGs and the SRWEC will result in long-term benthic habitat disturbance and can result in long-term impacts to EFH. However, the recently completed Draft EIS for the Revolution Wind project provides significantly more analysis of the long-term impacts from offshore wind development on benthic habitat than the Sunrise Wind Draft EIS, noting that monopile foundations under Revolution Wind's proposed action would "result in a direct disturbance of benthic habitats" and that these impacts "would be long term in duration." The Revolution Wind Draft EIS is highly relevant here because the Revolution Wind Farm will be adjacent to Sunrise Wind. The Revolution Wind Draft EIS explains that "[s]oft-bottom habitats would be permanently displaced while effects on large-grained complex and complex benthic habitats would range from short term to longer term or permanent." It also finds that the installation of monopiles and cables alters benthic habitat composition, converting existing large-grained, complex, and soft-bottom	Thank you for your comment. See below for the text that is already within the EIS and text that was added to address your comment. The following text is already included in the Final EIS in Section 3.7.3.2: "This offshore energy facility construction would involve direct disturbance of the seabed, leading to direct impacts on benthic, finfish, and invertebrate resources or degradation of sensitive habitats, including EFH." The following text was added in Section 3.7.3.2: "The installation of up to 94 offshore monopile foundations with associated scour protection would result in the direct disturbance and conversion of benthic habitats. The duration of these impacts would vary depending on the type of benthic habitat impacted. Disturbance of soft-bottom benthic habitat would flatten sand ripples, pits, and depressions and kill or displace habitat-forming invertebrates living on and in the seafloor within the impact footprint. Disturbance of complex benthic habitat during seafloor preparation could change benthic habitat composition by relocating boulders and cobbles and exposing soft substrates." Text regarding boulder relocation that would result in permanent conversion of habitats has been added. The Final EIS already includes several paragraphs detailing the succession of converted habitats and likely

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	benthic habitat to artificial or introduced hard surfaces and that these effects would be long-term to permanent. Likewise, for impacts from construction-related anchoring, the Revolution Wind DEIS concludes that soft bottom benthic habitats could be expected to recover within 18 to 24 months, whereas complex benthic habitats could take a decade or more to fully recover. The analysis in the Revolution Wind Draft EIS on potential long-term impacts to benthic habitats from offshore wind development is consistent with what has been observed at the Block Island Wind Farm. In a study of the Block Island Wind Farm, non-complex habitats, consisting mainly of sand and mud, demonstrated a high rate of recovery. Conversely, complex habitats have been shown to take longer to recover from offshore wind construction. In the Block Island study, zero percent of complex habitat areas, containing mainly cobbles and pebbles, had completely recovered from baseline conditions after the wind farm had been in operation for nearly two years. The conclusion in the Sunrise Wind Farm Draft EIS that impacts to benthic habitats are moderate, “as the overall effect would be notable but the resource would be expected to recover completely without remedial or mitigating action” is inconsistent with the analyses from nearby areas including the Block Island Study and Revolution Wind Draft EIS that both found the potential for long-term to permanent impacts on benthic habitats from offshore wind development. In the Final EIS for Sunrise Wind, BOEM should improve its analysis of the long-term impacts to benthic habitats from the Sunrise Wind project, and particularly its analysis of the long-term impacts from	consequences (See Section 3.7.5.2.2 under *Presence of Structures*). The following has been added to the conclusion of Alternative B, Section 3.7.5.6: "When placed in soft-bottom habitat, these structures would effectively change the habitat type. When placed in large-grained complex or complex habitat, these structures would either alter the habitat type or modify benthic habitat structure through burial and damage to habitat-forming invertebrates. That habitat structure would recover and would evolve over time into functional benthic habitat as reef effects mature. In all cases, the presence of structures would constitute a long-term to permanent impact to benthic habitat." Regarding anchoring, the 18- to 24-month recovery is stated in the Final EIS and backed up by several references used in Revolution Wind. The EIS states, "In areas of seafloor disturbance, benthic habitat recovery and mobile and sessile benthic infaunal and epifaunal species abundances may take 1 to 3 years to recover to preimpact levels, based on the results of a number of studies on benthic recovery (e.g., Hutchison 2020a, Carey et al. 2020; Guarinello and Carey 2020; AKRF et al. 2012; Germano et al. 1994; Hirsch et al. 1978; Kenny 1994). Based on a review of impacts of sand mining in the U.S. Atlantic and Gulf of Mexico, soft-bottom communities within the cable corridors would recover within 3 months to 2.5 years (Kraus and Carter 2018; Brooks et al. 2006; BOEM 2015; Normandeau Associates 2014). A separate review of case studies from cable

Comment No.	Comment	Response
	the installation of WTG structures, cable emplacement, and anchoring, and explain any inconsistencies between its conclusions in the Sunrise Wind Draft EIS and Revolution Wind Draft EIS.	installations in Atlantic and Pacific temperate zones concludes that recovery of benthic communities on the OCS (less than 262 ft [80 m] depth) occurs within a few weeks to 2 years after plowing, depending on the available supply of sediment (Brooks et al. 2006). Recovery time varies somewhat with the method of installation, with more rapid recovery after plowing than jetting (Kraus and Carter 2018)." The conclusion stated in Section 3.7, *Benthic Resources* is reflective of conclusions stated by Revolution Wind (see last paragraph, pg. 3.6-8 in Revolution Wind). The conclusion sections of the two EISs are extremely similar, although it is important to note, the Revolution Wind EIS is proposing up to 100 WTGs and while the Sunrise Wind EIS is proposing up to 94 WTGs and a lower limit of 80 WTGs (Alternative C-3c), and some of their impact conclusions differ accordingly. Several sentences have been added to the conclusion sections of the Proposed Action to replicate text from Revolution Wind and emphasize the similarity in effects and conclusions.

O.6.5. Birds

Table O-14. Responses to Comments on Birds

Comment No.	Comment	Response
BOEM-2022-0071-0232-0029	Sunrise Wind will occupy a site within the migratory Atlantic flyway region and will thereby add additional stress to four (4) endangered bird species, including the Piping Plover, the Red Knot, Roseate Tern, and the Black-capped Petrel (App E2; BRI, 2022). Two threatened eagle species, the Golden Eagle and the Bald Eagle reside in RI as well. RI is home to the Norman Bird Sanctuary, a 325-acre nature preserve overlooking Rhode Island Sound, as well as the adjacent 242-acre Sachuest Point National Wildlife Refuge. Both sanctuaries provide a vital stopover and wintering area for migratory birds. The continued development of this region with offshore wind farms could violate the Endangered Species Act (16 U.S.C. §§1531-1544), the Migratory Bird Treaty Act (16 U.S.C. §§ 703 et seq.), and the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d). 432 bird species in North America risk extinction. Birds with coastal habitats are particularly vulnerable (Schwemmer, 2022). Current methods for assessing an offshore wind farm's risk to birds remain inadequate (Green, 2016), underestimating the impact of wind farms on bird mortality (Skov, 2016). The BOEM DEIS does not adequately address the direct, indirect, or cumulative impacts of Sunrise Wind on bird mortality.	The most recent literature and data were used to prepare a separate Biological Assessment for USFWS Section 7 consultation under the ESA for listed bird species. Based on a review of all relevant literature, our conclusion remains the same.

Comment No.	Comment	Response
BOEM-2022-0071-0242-0044	The DEIS correctly identifies key federally listed species such as Piping Plover, Red Knot, and Roseate Tern as having potential to occur in or near the Project Area. The plover is also state-listed endangered in New York and threatened in Massachusetts. Red Knot is state-listed threatened in both New York and Massachusetts, and the tern is state-listed endangered in both states. At least 12 bird species of conservation concern have been detected within New York State Breeding Bird Atlas Survey Blocks that overlap with onshore facilities slated for this Project. Roseate Terns also may forage for small prey fish in the shallower waters near the location of the Sunrise Wind Export Cable, New York State (SRWEC–NYS), and may occur over the sites of both SRWEC–NYS and SRWEC–Outer Continental Shelf during migration. New York state-listed Common Tern also has potential to occur over the Project during migration. Red Knot, Piping Plover, and Roseate Tern all migrate through offshore waters at the Project as well as other nearby wind energy project sites in the region. Past tracking studies clearly indicate that at least some individuals of all three species can pass through Rhode Island and Massachusetts offshore wind lease areas. Consequently, the post-construction monitoring programs for all three of these listed species should remain effectually robust to detect any impacts offshore. We are pleased that Örsted and Eversource will provide Motus wildlife tracking tags to continue studying ESA-	Thank you for this information. The Biological Assessment completed for Section 7 consultation with USFWS included the information from Loring et al. (2018). The analysis for the Final EIS was updated in Section 3.8.5.2.2 with this additional information to properly assess the potential impact to listed bird species.

Comment No.	Comment	Response
	listed birds. Radio-tagged bird movements in the vicinity of the Project would be monitored for up to three years post-construction during spring, summer, and fall. The total number and location(s) of offshore receiver stations would be selected to optimize study goals with a design tool now under development with a NYSERDA project. A tagging study of ESA-listed bird presence/absence in the wind farm would be compared to similar detections at coastal receiver towers, with an aim to understand occurrence of these birds by time of day, season, and weather conditions. Although the risk assessment for Piping Plover states that the latest historical breeding records on Block Island are in the early 2000's, in fact the plover nested there in 2021 and 2022. In addition, focusing on islands closest to Sunrise Wind could lead to underestimating risk to the local breeding population, since the bulk of the New England population of Piping Plovers nests in Massachusetts. The New England subpopulation of Piping Plover is also the only subpopulation along the Atlantic Coast that has reached and exceeded its recovery target–all other subpopulations (i.e., Canada, NY-NJ, Southern) have yet to reach targets set by the recovery plan. Based on nano-tagging data, many of the Piping Plover nesting in southeastern Massachusetts are likely to fly over or near the Project at the start of their migration, which places this key subpopulation at risk.	

Comment No.	Comment	Response
BOEM-2022-0071-0242-0046	Birds other than imperiled species are also potentially vulnerable to impacts from offshore wind or have uncertain population trends in relation to expanding footprints of wind energy infrastructure in the region. Moreover, larger-bodied species of birds can make better study subjects for understanding migratory connectivity and for determining optimal locations for population monitoring and mitigation. We note that no birds other than those discussed above, including pelagic marine species, are the subject of any part of the Sunrise Wind monitoring framework. The lack of monitoring efforts for non-ESA listed (but still vulnerable) focal bird species around wind energy infrastructure seems like an oversight. For example, recent tracking of White-winged Scoters in southern New England has revealed frequent commuting flights between Nantucket Sound and Long Island Sound, which would result in overflights of wintering Scoters in the Project Area despite their habit use generally being in shallower waters. Risk to this species may thus be higher than predicted, and further monitoring attention is warranted.	Appendix H includes a variety of bird mitigation and monitoring including a Post-construction Avian and Bat Monitoring Framework.
BOEM-2022-0071-0242-0047	Baseline and site characterization surveys of marine birds in and near the Project have revealed a diverse assemblage of diving marine birds present seasonally, including cormorants, sea ducks, alcids, and loons. MDAT baseline surveys typically reveal such diving species to be present at and near Sunrise Wind during winter and spring. Given that no data is available for some diving species in some seasons, the temporal and spatial resolution used in future bird surveys may need to be	Additional information from McGrew et al. 2022 has been added to the EIS. While noise generated from pile driving and G&G surveys will overlap with hearing ranges for diving birds, very little information exists on the risk of injury to diving birds from underwater sound sources. Without bird-specific information, we assume that marine birds have relatively similar physiology to marine mammals for the purpose of risk assessment (phocid pinnipeds due to similarity of hearing profile).

Comment No.	Comment	Response
	increased to adequately determine sensitivity of all diving species to impacts like underwater acoustic disturbance. When studied, underwater hearing abilities for diving bird taxa are found to be more sensitive than expected, with hearing thresholds in the frequency band 1–4 kHz comparable to those measured in seals and toothed whales. Diving marine birds foraging <100 km away from seismic operations change their foraging direction during acoustic disturbance, increasing the distance between their feeding areas and the sound source. Avoidance distances by diving seabirds to sounds generated from anthropogenic activities manifest at spatial scales up to tens of kilometers, very similar to the displacement distances reported in cetaceans from seismic surveys. The monitoring framework for Sunrise Wind does not assess how acoustic disturbances from construction and related operations may cause harm to diving marine birds. We refer specifically to lethal or sublethal injury from sound pressure waves caused by high intensity acoustic pulses, not to avoidance or temporary displacements after changes in behavior. Because seabird taxa sensitive to this impact are more prevalent during winter, minimization activities like curtailment may be justified to abate harm. Capable of diving to 180 m depths, Razorbills also flush from loud noises, they are prevalent during winter in waters of the Project Area, and like other alcids they are already vulnerable to	With the included and required 10 dB of broadband sound attenuation for offshore pile driving associated with monopile foundations and the OCS-DC foundation pin piles, the area of potential injury for diving birds from a single strike of an impact hammer is expected to be relatively small, less than 10 m (32.8 ft) from the pile for Permanent Threshold Shift (PTS) (see COP Appendix I1). The risk of other pressure-induced injuries or mortality would have even smaller areas of potential effects. Because of the flushing behaviors and avoidance anticipated from the noise disturbance, and the capability of birds to leave the water, the potential for PTS and Temporary Threshold Shift (TTS) is considered unlikely to occur.

Comment No.	Comment	Response
	displacement and macro-avoidance. Densities of diving birds are typically highest in winter months on inner and middle shelf habitats, at least in this portion of the Atlantic OCS. Therefore, shifting the construction season for pile-driving and other noisy operations may eliminate underwater acoustic disturbance to diving birds. If time/area closures are not practical, safety zones (e.g., shut downs or low power operations if large diving bird flocks enter a predefined zone) or methods for sound abatement should be considered. Noise monitoring and abatement during impulsive pile driving operations for monopile installation has been an established practice in Atlantic wind energy project areas. Distances to the injury-causing sound levels measured in one study varied from 0.7 to 3.1 km for marine mammals during the installation activities. Consequently, adequate spatial buffers or suitable observation distances may be necessary for the study designs used to monitor avian reactions to subsurface acoustic disturbance.	
BOEM-2022-0071-0242-0049	To reduce long-term phototactic attraction of wildlife to offshore lighting, Sunrise Wind's construction and operational lighting would be limited to the minimum necessary to ensure safety and compliance with applicable regulations, an approach that is hoped to minimize impacts on avian species. Under BOEM lighting guidelines and best management practices	The Final EIS includes a full description of lighting associated with installed WTGs and the OCS-DC. Lighting will include proximity activated obstruction lighting and navigational lights. Aviation obstruction lights would be medium intensity flashing red lights and be operated using an Aircraft Detection Lighting System. This would only activate the aviation obstruction lights when

Comment No.	Comment	Response
	(BMPs), Sunrise Wind will use Aircraft Detection Lighting Systems, dimming, or shielding to limit visual impact, pursuant to approval by the FAA, commercial and technical feasibility at the time of FDR/FIR approval, and dialogue with stakeholders. Such reduced lighting practices are anticipated to reduce the potential for impacts to avian species, although no provisions for studying avian response(s) to lights has been made in the monitoring framework. We stress that phototaxis (disoriented attraction of birds drawn from some distance to lights on turbine towers) creates conditions in which the bird numbers attracted will scale as the square of the range from which they are drawn, thereby greatly increasing potential for adverse impacts (i.e., higher collision risk). More research and monitoring is needed to measure distances at which phototaxis operates in seabirds (especially the susceptible procellariiforms). In the context of collision with turbine blades, the probability of collision is inflated by flux density as disoriented birds pass repeatedly through rotor swept areas. Neither the avian risk assessment nor the avian monitoring framework address a potential of high flux density caused by turbine-associated phototaxis. Previous research indicates that spatial responses of marine birds to offshore wind infrastructure can consist of (1) displacement around, (2) attraction to, (3) or neutral association with the overall project footprint.	aircraft are in the vicinity of the wind farm, typically reducing the illuminated time by more than 99 percent. Navigation lights would operate at night and would consist of low (2 nm [2.3 mi; 3.7 km] visibility) to moderate intensity (5 nm [5.8 mi; 9.3 km] visibility) flashing yellow lights. Only significant perimeter structures would have the moderate intensity lights (perimeter structures every 2 km [1.2 mi]). All other structures would use low intensity flashing lights. Based on the minimal lighting used, vastly reduced operational time for aircraft avoidance lights, and the use of flashing lights only, we believe nighttime lighting will not alter attraction or avoidance patterns for birds compared to unlit structures.

Comment No.	Comment	Response
	One large literature review of North American and European avian reactions to wind farms indicates that displacement in offshore habitats is 2–3 times more prevalent than attraction. Across 71 peer-reviewed studies, avian displacement distances from turbines (mean ± standard deviation) ranged from 116 ± 64 m in Anseriformes (ducks), 2,517 ± 5,560 m in Charadriiformes (gulls, terns, shorebirds), and 12,062 ± 6911 m in Gaviiformes (loons).	
BOEM-2022-0071-0242-0050	Sunrise Wind seeks to evaluate avoidance rates of marine birds using a one-to-two-year cross-project radar study to detect macro and potentially meso-scale avoidance rates at the project site. Although some information on avoidance can be helpful to advance understanding of both displacement and collision vulnerability, no descriptions or citations are given for the study design(s) that would be applied to evaluate how avian displacement is manifest at Sunrise Wind and associated wind farms. Study design is especially important here given the suggestion that wide spacing of WTGs at Sunrise Wind is thought to reduce risk of barrier effects and/or displacement, and allow avian and bat species to avoid individual WTGs and minimize risk of potential collision. To detect differences in avian distribution pre- and post-construction, surveys must be designed and implemented to account for detection bias, to adequately cover the lease area and its surroundings, and to collect data at the necessary resolution. The avian	Thank you for your thoughts on micro avoidance. These thoughts will be taken under consideration as the avian and bat post-construction framework is developed into a plan.

Comment No.	Comment	Response
	monitoring framework makes no mention of how to detect or estimate micro-avoidance (i.e., the behavioral ability of birds and bats to make last minute adjustments at small scales to avoid collision with rotors and other turbine structures).	
BOEM-2022-0071-0242-0044	Avian risks from offshore wind energy development can be curtailed first and foremost by avoiding concentrations of marine birds on the OCS. Optimal siting relies on some measure of severity in spatial conflict between bird protection and efficient generation of offshore wind power. Sunrise Wind lies outside the primary use areas of most coastally breeding bird species, yet also far enough away from elevated marine bird concentrations at and beyond the continental shelf edge. The offshore distances for the Project (>24.1 km) thereby allows the Project to avoid offshore habitats with the highest aggregate abundance of marine birds, appropriately following the mitigation hierarchy.	Thank you for your comment.

O.6.6. Coastal Habitat and Fauna

Table O-15. Responses to Comments on Coastal Habitat and Fauna

Comment No.	Comment	Response
BOEM-2022-0071-0242-0074	Regarding the SRWEC landing, the COP states that Sunrise Wind intends for landfall to take place within Fire Island National Seashore. Sunrise Wind intends to employ a horizontal directional drilling (HDD) method for burying the SRWEC at the cable landing in the Fire Island National Seashore. Sunrise Wind also intends to employ HDD for the portion of the SRWEC route that traverses the Intracoastal Waterway between Fire Island and the mainland. The COP observes that the SRWEC route in the Intracoastal Waterway may cross under submerged aquatic vegetation (SAV) habitats, consisting of both eelgrass and Widgeon grass, and macroalgal mats that are considered HAPC for summer flounder and that the use of HDD will avoid impacts to these habitats. The use of HDD for cable landing has been found to avoid and minimize impacts to benthic and coastal habitats. Indeed, the Draft EIS finds that by crossing under the seabed, the use of HDD would avoid most impacts to benthic habitats and subaquatic vegetation in the Intracoastal Waterway. The Draft EIS notes that installation of the cable via HDD would “avoid direct impacts to marine vegetated habitats as this methodology avoids disturbance to the seafloor.” This, in turn, would avoid and	Text has been added in Section 3.9.5.1.1 under 'cable emplacement'. Please keep in mind that IPFs and potential impacts discussion follows that documented in OCS Study BOEM 2019-036 and is intended to ensure that all information regarding potential impacts to coastal habitats and fauna are provided to the public.

Comment No.	Comment	Response
	minimize impacts to the summer flounder HAPC in the area of the Intracoastal Waterway. Given that the SRWEC landfall will occur within a national seashore and that the Intracoastal Waterway includes SAV designated as HAPC for summer flounder, the use of HDD is crucial for avoiding and minimizing environmental impacts. Although Sunrise Wind has already committed to employing HDD for the project's landfall and for traversing the Intracoastal Waterway, BOEM should require use of HDD as a condition for project approval.	

O.6.7. Commercial Fisheries and For-Hire Recreational Fishing

Table O-16. Responses to Comments on Commercial Fisheries and For-Hire Recreational Fishing

Comment No.	Comment	Response
BOEM-2022-0071-0147-0005	I also noticed that there are several instances where the effects offshore wind construction is compared to the effects of commercial fishing. I think these assumptions are inappropriate within an offshore wind DEIS. As stated at the beginning of the DEIS, this report “assesses the potential biological, socioeconomic, physical, and cultural impacts that could result from the construction and installation, operations and maintenance (O&M), and conceptual decommissioning of the Sunrise Wind Farm” NOT the fishing industry.	The impacts to the fishing industry correlate to economic and employment impacts to many businesses and individuals in the GAAs; therefore, although commercial fishing may not be a "resource" in the context of the Proposed Action, it warrants full analysis to understand the potential impacts.
BOEM-2022-0071-0158-0022	Table 3.6.1-1 through Table 3.6.1-11 include average commercial fishing landings and revenue data over many years. While this is helpful to gain a broad understanding of the level of revenue exposure in the lease area and cable routes, including data by year is most helpful, similar to what is provided in NOAA’s Socioeconomic Impacts tool. This annual information is displayed in a poster in the virtual meeting room, however, it does not appear to be included within the DEIS for commercial fishing, like it is for for-hire fisheries. Fisheries revenues can fluctuate for a variety of reasons (changing fish distributions, change in fishing regulations, market factors, etc.), therefore, an average value may not always accurately describe the economic value of the fishery.	Final EIS Tables 3.14-1 and 3.14-11 (previously Tables 3.6.1-1 and Table 3.6.1-11 in the Draft EIS) have been updated with newer data that became available following the release of the Draft EIS. It is understood that landings and revenue fluctuate due to many variables from year to year. However, by including both the average annual and peak annual statistics for each category, as well as providing data across a sufficient year range (in this case, 14 years), the information provided is sufficient for the purposes of the EIS analysis. For additional data, the reference is provided which directs readers to the NOAA Socioeconomic Tool.

Comment No.	Comment	Response
BOEM-2022-0071-0158-0023	We recommend better characterizing which commercial and recreational fisheries and fish species would be affected by various stages of wind development and why. Unless necessary to protect confidential data, grouping data across all FMPs is not particularly helpful given the impact determinations could differ by fishery and species.	Data for the Revenue Exposure Analysis is primarily available at the Fishery Management Plan fishery level. A qualitative discussion of certain species' impacts relative to the different areas in and around the Lease Area is presented within the discussion of Alternative C-1 in Section 3.14.6, as the potential location of WTGs may incrementally change potential impacts on certain species depending on habitat.
BOEM-2022-0071-0158-0024	Table 3.6.1-13 includes the number of vessels and outliers in the lease area by year; however, the table description and corresponding text do not include a description on what is meant by 'outliers.' This is a term that is typically used for observations that lie an abnormal distance from other values in a sample. Only the text on a preceding page indicates that the outliers are vessels that derived a high proportion of its revenue from the lease area. No analysis is presented that shows this determination used standard statistical techniques, for example, the third quartile plus 1.5 times the interquartile range is a standard approach to estimating 'mild' outliers. The FEIS should describe specifically how these outliers were determined. In some years, 15% of the vessels are characterized in this way, which is a large percentage, suggesting the underlying data generally cover a narrow range of values, but with a substantial number of vessels falling outside the range. In addition to documenting the methods, we suggest calling these vessels "highly dependent", including more detailed table captions and column headers for tables, and including cross references to tables in the corresponding	The data presented in Final EIS Tables 3.14-12 and 3.14-13, and depicted in Figure 3.14-2, are derived from NOAA's planning-level assessment for the Sunrise Wind Lease Area. The definition of the outlier in the context of this analysis is presented within the text and associated footnote, as documented within NOAA's analysis. Note, this data was also updated based on new information that became available since the release of the Draft EIS, essentially expanding the years covered.

Comment No.	Comment	Response
	text.	
BOEM-2022-0071-0158-0026	Highly Migratory Species (HMS) trips are only briefly mentioned on page 3-689 and do not include any corresponding data tables or specific information by species. We recommend including the number of trips, landings, and revenue by species in the fisheries affected environment and impact section.	Highly migratory species are discussed in Section 3.14 in several instances, such as Table 3.14-4, which includes average and total revenue as well as the average number of vessels and vessel trips in the Lease Area, Table 3.14-5, which includes the average and total pounds of landings in the Lease Area, and Table 3.14-22, which provides estimates on revenue exposure from the Proposed Action. In addition, additional text and Figure 3.14-9 has been included in Section 3.14.1.2, *For-Hire Recreational Fishing*, which presents fishing effort for highly migratory species in the Greater Atlantic.
BOEM-2022-0071-0158-0027	Pages 3-408, 3-419, and 3-425 reference the potential for commercial and for-hire recreational vessel operators to switch gear types and to target less-valuable species. These may not be feasible approaches for fishermen given the high cost, potentially lower prices, and different permits that would be required. Such adaptation would only occur over the longer term and may require fishery management changes.	Text has been added to indicate this may not be feasible for fishermen based on these conditions. The Final EIS acknowledges that targeting less productive fishing grounds and/or less valuable species would not alleviate all impacts, but may be what certain fishermen choose to do.
BOEM-2022-0071-0158-0028	The fisheries revenue exposure compares FMP revenue exposure within the lease area toxz the total annual FMP revenue in the Mid-Atlantic and New England regions. This comparison minimizes the potential impact of lease development on fisheries. We recommend comparing revenue exposure to a more geographically specific area or port	In the Final EIS, two new revenue exposure tables have been included that present the revenue exposure based on port and state.

Comment No.	Comment	Response
BOEM-2022-0071-0158-0029	The DEIS describes commercial and recreational fisheries within the lease area and the export cable corridor. Some fisheries will be impacted by activities within both the lease area and the export cable corridor, while other fisheries will be primarily impacted by one or the other. It is important to consider the differences in impacts due to the different activities which will occur in the lease area and the cable corridor and the different fisheries that operate in those areas. Different mitigation measures may also be relevant for the two areas. For these reasons, we support the approach of analyzing the lease area and export cable corridor separately in terms of their impacts on fisheries, as well as considering their combined impacts. This approach should be carried forward in future analyses of other wind projects.	Due to the fact that the cable corridor impacts are temporary in nature during the construction period, a quantitative analysis of revenue exposure was determined not to be necessary.
BOEM-2022-0071-0229-0018	Commercial Fishing Impacts: BOEM's stated "facts" and associated "conclusions" do not match up. BOEM on one hand states that "Sunrise Wind proposed to bury all cables to a target depth of 3 to 7 ft".41 But then in conclusion states that "burial to the target depth would reduce the risk of exposure and potential damage to fishing gear and a burial depth of less than six feet would increase the probability of gear interactions". How can a target burial depth of less than 6 feet (the target depth is 3-7 ft) reduce the risk of gear interactions if the risk of gear interactions is supposedly any burial depth of less than 6 feet? BOEM is stating that the target burial depth is less than 6 feet. It is completely illogical, then, for BOEM to state that the target burial depth reduces the chances of gear interaction. It does not. The conclusions	The text within Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*, was revised to say a burial depth of less than 3 feet (0.9 m) would increase the probability of gear interactions. Target burial depth for is now 4 to 6 ft (1.2 to 1.8 m) as stated in the Sunrise Wind COP published in September 2023.

Comment No.	Comment	Response
	must be changed.	
BOEM-2022-0071-0229-0019	BOEM must also include biological impacts in the commercial fishing impacts section and translate these to commercial fishing impacts. Commercial fishing relies exclusively on the natural environment for its product. If the natural environment is affected, commercial fishing will be affected. The commercial impacts section contains no analysis- not even qualitative analysis- of impacts to fisheries resources as a result of the proposed Project's open water cooling intake system for its OCS-DC. This is unacceptable. The full impacts to commercial fishing and commercial species as a result of the proposed Project must be conducted and quantified. BOEM cannot simply say after the fact that "fish stocks died off due to climate change" when the very Project that it is proposing creates aquatic thermal climate change in an intense and unnatural way. It is well known that open water cooling intake systems kill fish eggs and larvae through entrainment, as well as change the thermal environment that such eggs and larvae rely upon for survival. Other such studies with quantitative analysis have been conducted, and we request that BOEM do so here.	An analysis of potential egg and larval entrainment, as well as equivalent adult calculations, were conducted and reported in the Final EIS in Section 3.10.5.2. The OCS-DC includes mitigation measures to prevent impingement of juvenile and adult fish as well as other measures to lessen the impact on local fish. The minor entrainment estimates for egg and larval species would create localized, low-intensity impacts around intakes and discharges, and not have more than negligible species-level impacts on commercial fisheries or for-hire recreational fishing.
BOEM-2022-0071-0248-0015	It is imperative the public is able to differentiate impacts from the various alternatives presented in the DEISs to understand the suitability of prospective project alternatives. The DEISs analyze the impacts of multiple grouped alternatives primarily as modifications to the Proposed Action, rather than against each other. Using fisheries as an example, the DEISs present Impacts	The overall revenue exposure analysis was conducted on the Lease Area being considered. The alternatives to the Proposed Action include movement of certain WTGs from one area to another within the Lease Area for the purposes of habitat impact minimization. Therefore, as discussed in Final EIS Section 3.14.6 and 3.14.7, by reducing the impact to certain valuable habitat within

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	Analysis for Commercial and For-Hire Recreational Fisheries for each of the Alternatives together. That each DEIS acknowledges major adverse impacts on commercial fisheries is much appreciated.21 It is unclear in the documents how impacts from the various alternatives differ from each other. Instead, the impact analysis compares the collective back to the Proposed Action, which the DEISs assume would be the most likely "Alternative". From discussions with leaseholders in other project areas, it is our understanding that technical constraints may be realized after DEIS completion that make the Proposed Actions unfeasible. Yet, it is still the project design that all other alternatives are compared against.	the Lease Area, that would in turn have a slight benefit to both commercial fisheries and for-hire recreational fishing. This is discussed qualitatively within Section 3.14.8, *Comparison of Alternatives*; however, a quantitative presentation of revenue exposure data was not completed.
BOEM-2022-0071-0248-0016	The Sunrise DEIS provides specific information on boulder removal/relocation. Inclusion of the following is much appreciated, "[t]he relocation of boulders also could increase the risk of gear stags22, as uncharged or unknown obstructions could result in damage to equipment, lost revenue and potential safety impacts." (Sunrise DEIS, p. 3-421). More clarity should be provided on when a boulder will be removed or relocated. Areas proposed for relocation should be vetted by the fishing industry to avoid placing obstructions in fishing grounds. When a boulder is relocated, the exact original location and the location where it is being moved need to be communicated to the fishing industry. Fishermen acquire and retain knowledge and information on the location of boulders and other potential snags. These are typically marked on a vessel's GPS chart-plotter and	BOEM will be proposing a Boulder Relocation Plan, which would incorporate the identification of fishing history in the area. This would propose the inclusion of identifying active areas for bottom trawl fishing (within last 5 years) and areas where boulders are expected to be relocated, methods to minimize quantity of seafloor obstructions, identification of locations of boulders to be moved and where they would be placed, and outreach with respect to the boulder relocation plan. This measure is outlined in Table H-2 and H-3.

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	fishing operations are designed to avoid interactions. Failure to communicate the exact locations of relocated boulders will impact safety-at-sea and increase the likelihood of gear loss and lost fishing time while making necessary repairs.	
BOEM-2022-0071-0248-0017	We assume “gear stags” is meant to read “gear snags	Correct, text has been revised accordingly. Thank you for your comment.
BOEM-2022-0071-0248-0026	Sustainable American fisheries rely on monitoring and data collection activities tailored toward answering key fisheries management questions, under the “best available science” mandate of the Magnuson-Stevens Act. This means available data is typically not well-suited to inform fine-scale OSW planning or test hypotheses related to its environmental impacts. This is particularly true when considering available socioeconomic data for fisheries and OSW.	The approach to providing revenue exposure as it relates to the Proposed Action and Lease Area was identified as a suitable means to assess potential impacts on commercial fisheries. Working collaboratively between BOEM and NMFS, the best available data was applied to the Project Area to assess impacts at scale. Due to confidentiality concerns, some fine-scale data and analyses are not possible.
BOEM-2022-0071-0248-0027	Concern remains about the datasets utilized in the DEISs to reflect commercial fishing activity in and around the Project Areas. The Sunrise DEIS utilizes VMS datasets from 2014 - 2019. We appreciate acknowledging changes that happened to the fishing industry resulting from Covid-19. We recommend extending the VMS dataset coverage for at least 10 years prior to 2014. This would allow a more informed analysis of those commercial fisheries that are required to utilize VMS. It appears Sunrise considered AIS datasets from July 1, 2018 - June 30, 2019. This should have been updated to include April of 2016 through the publication of the COP. It bears noting that under applicable USCG regulations, not all commercial	New polar histograms have been included in the Final EIS that cover the years from 2014-2021. These are Figures 3.14-3 through 3.14-8. However, this newer data did not change the conclusions noted in the Final EIS.

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	fishing vessels are required to possess and utilize AIS. As a result, any statement which attempts to quantify fishing vessel traffic in the lease sites likely significantly underestimates the actual amount of commercial fishing traffic in the survey area."	
BOEM-2022-0071-0248-0028	Looking at each fishery individually is the only way to fully analyze and understand the potential impacts. For example, "A total of 75 percent of the permitted vessels that fished in the Lease Area derived less than 1 percent of their total annual revenue from the area (NMFS 2022a). The highest percentage of total annual revenue attributed to catch within the Lease Area was 84 percent in 7 different years during the 2008-2020 timeframe" (Sunrise DEIS 3-392) may indicate the remaining 25% of the permitted vessels could be very reliant on the areas. By aggregating the fisheries data, the DEISs will compact effort and lose the more minor, but equally important, impacted fisheries.	Due to confidentiality concerns, certain datasets (such as these statistics on annual permit revenue) need to be aggregated. This information was based upon data from NOAA's planning-level assessment specific to the SRWF Lease Area. The boxplot and percentages are explained in the text, where the data shows that the majority of permit holders derive 1 percent or less of the annual revenue from the Lease Area. The point within the comment is acknowledged that the remaining 25 percent of permit holders may derive up to 85 percent of their revenue from the Lease Area by indicating that certain vessels may depend heavily on the Lease Area, but most derive a much smaller portion of their revenue from the Lease Area. The data is not available by specific fishery.
BOEM-2022-0071-0248-0029	"On average, commercial fishing activity in New England and the Mid-Atlantic generated approximately $1.2 billion in annual ex-vessel revenue from 2010 through 2019." (Sunrise DEIS page 3-376) While this (ex-vessel revenues) shows the economic benefits to the fishing vessels, it does not account for any downstream economic activity. Failing to identify, quantify, and assess these downstream impacts is a flaw in the DEISs analysis. In addition to analyzing economic impacts, the DEIS fails to undertake an analysis of the impacts to jobs	Table 3.14-25 of the EIS provides a description of the BOEM-proposed Fisheries Mitigation Measure, which includes stipulations related to loss of income due to unrecovered economic activity to offshore fishing activities, along with shoreside businesses for losses indirectly related to the Project.

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	in the commercial fishing/seafood industry. (See section D below) In 2018, the Mid-Atlantic seafood industry supported 136,813 jobs, while the New England seafood industry supported 211,359 jobs.	
BOEM-2022-0071-0248-0030	The commercial fishing revenue information provided needs to be put in context. There are many small businesses reliant upon access to fishing grounds within the lease areas and have developed business plans and made investments over the years with the expectation of utilizing those grounds. For example, according to Table 3.6.1-6 of the Sunrise DEIS the average annual revenues generated by Federally permitted vessels participating in the Mackerel, Squid and Butterfish fisheries within the lease areas was $107,462. These revenues are likely indispensable to the small businesses prosecuting that fishery.	To enhance the visibility into potential impacts on small versus large businesses for commercial fishing operations fishing the Lease Area, two additional tables have been included in the Final EIS, Section 3.14.1.2. These are based upon NOAA's planning-level assessment and include the total number of entities by small and large business category within the northeast region (Table 3.14-13), along with their total revenue. This is then contrasted by a second table that provides commensurate information for the number of entities by small and large business categories operating within the Lease Area, along with their total revenue (Table 3.14-14). The results show that most commercial fishing operations in both the northeast region as well as within the Lease Area are considered small businesses and these small businesses also generate more total revenue overall than the large businesses.
BOEM-2022-0071-0248-0031	The DEISs fail to fully address the impacts that the projects will have on small businesses, which will include the vast majoring of fishing companies and supporting businesses. Fishermen and the fishing industry have reiterated time and time again that it is not easy for adaptation to occur because serious economic investments and management restrictions can make it prohibitive. The impacts to fishing and processing jobs must not be diminished in the DEIS analysis. As	To enhance the visibility into potential impacts on small versus large businesses for commercial fishing operations fishing the Lease Area, two additional tables have been included in the Final EIS, Section 3.14.1.2. These are based upon NOAA's planning-level assessment and include the total number of entities by small and large business category within the northeast region, (Table 3.14-13), along with their total revenue. This is then contrasted by a second table that provides

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	recommended by the U.S. Small Business Administration for Fisheries Mitigation Guidance, BOEM must conduct a Regulatory Flexibility Act (RFA) analysis of its proposals, including these DEISs, to adequately understand the impacts of offshore wind development activities on small businesses. Improved data and analyses of impacts to commercial fishing businesses, port infrastructure serving the fishing industry, port operators, marine equipment retailers, onshore processors, fish markets, and other fishing industry representatives, should inform mitigation strategies.	commensurate information for the number of entities by small and large business categories operating within the Lease Area, along with their total revenue (Table 3.14-14). The results show that most commercial fishing operations in both the northeast region as well as within the Lease Area are considered small businesses and these small businesses also generate more total revenue overall than the large businesses.
BOEM-2022-0071-0248-0035	Fisheries Communications Plans The Fisheries Communication Plan (FCP) for both Sunrise Wind and CVOW focus primarily on informational meetings and information dissemination. While this is an important component of any FCP, we again reiterate the importance of having a two way communication flow to ensure that fishermen are authentically included. The first step must be the development of written commitments that the developer and their representatives respect the input, inclusion and limited available time to participate in meetings. Fishermen have already put time and resources into providing feedback (through meetings and written letters described above) and nowhere indicates if or how they plan to incorporate the feedback they have already solicited. We have requested numerous times to BOEM, developers, and states to work directly with the fishing industry to provide readily accessible project information. Repeatedly, fishermen have requested	The Fisheries Communications Plan for the SRWF Project (Appendix B of the Sunrise Wind COP; Ørsted Offshore North America 2021) indicates several methods of two-way communication, noting different ways to collaborate and understanding the best ways to communicate with fishermen and having an "open door policy" to listen to concerns regarding offshore wind development. In addition, both a Fisheries Liaison (FL) and Fishing Representatives (FR) will be identified to assist in communication and provide a conduit between ports/communities and the developer.

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	Atlantic lease holding developers to improve the basic dissemination of project information—shoreside and, perhaps more importantly, on the water. RODA urges BOEM to work with us to ensure that we can effectively get critical project information to fishermen in a relevant and accessible manner. We also respectfully request that timely provision of relevant project information for these purposes in a format determined by the fishing community be a condition of any OSW permit that BOEM may issue in the future.	
BOEM-2022-0071-0248-0036	Fisheries management relies on fishery dependent and independent data collection to understand and track populations over time and to set sustainable quotas. Disruptions to survey methodology and data collection, without adequate time and analyses for adjustment, will be detrimental to our understanding of fish stocks and ultimately may lead to reduced quotas for the fishing industry. RODA acknowledges that BOEM and NMFS have recently published the final federal survey mitigation strategy but is concerned that the active surveys that overlap with Sunrise Wind and CVOW will be negatively impacted by these projects, should adapted survey methods not be implemented immediately.	The potential disruption of NMFS marine resource survey operations is noted within the Presence of Structures IPF in the Final EIS. Potential impacts associated with this interruption could be increased uncertainty in stock assessments and changes in the fishery quotas based on existing fishery management council rules.
BOEM-2022-0071-0158-0025	We appreciate that the DEIS includes recent fishery data and mentions impacts to NMFS scientific surveys.	Thank you for your comment.

O.6.8. Cultural, Historical, and Archaeological Resources

Table O-17. Responses to Comments on Cultural, Historical, and Archaeological Resources

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BOEM-2022-0071-0232-0020	The project will degrade the historical value of 307 properties with historical relevance within the viewshed. Colonial landmarks attract more tourists than any other type of historical site (Cameron, 2010). Degrading these resources will have an unknown, but potentially indescribable and irreparable negative impact. The impact on historic properties violates the Historic Preservation Act (Public Law 89-665; 54 U.S.C. 300101 et seq.) The DEIS minimizes the impact on our cultural heritage and does not consider the difference between colonial history and other types of historical landmarks.	EIS Section 3.16 assesses impacts from the Proposed Action and the NEPA Alternatives on the local economy while EIS Section 3.21 assesses impacts on recreation and tourism. Historic properties are addressed under Cultural Resources in EIS Section 3.15. As stated in Section 3.15 of the EIS: "Both NEPA and the National Historic Preservation Act (NHPA) require federal agencies to "stop, look, and listen" before making decisions that could negatively impact cultural resources (CEQ and ACHP 2013). NEPA requires federal agencies to assess the impacts or effects of a proposed Federal action to the human environment, including historic and cultural effects/impacts (40 *CFR* § 1500-1508). Historic and cultural impacts/effects are assessed by determining the significance of potential impacts to cultural resources. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties (36 *CFR* § 800.1)." BOEM has reviewed technical reports completed by Sunrise Wind to both identify historic properties that may be affected by the Project and to assess the Project's effects to those potentially affected historic properties. BOEM has deemed these reports complete and sufficient.
BOEM-2022-0071-0249-0002	Our comments address numerous deficiencies: (1) the DEIS is inadequate because it fails to take a "hard look" at impacts to historic and cultural resources by	(1) The EIS provides detailed descriptions of the impacts of the Project. The EIS Introduction, Sections 1.5 and 1.6, provides the methodology for assessing the

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	undervaluing their significance, undervaluing their connections to a pristine ocean viewshed, and downplaying adverse impacts to their economies; (2) the DEIS fails to consider all direct, indirect, and cumulative effects of Sunrise Wind and other reasonably foreseeable wind farms; (3) BOEM has failed to comply with Section 106 of the National Historic Preservation Act; (4) BOEM has failed to use all possible planning to minimize harm to National Historic Landmarks as required by Section 110(f); and (5) BOEM has misclassified critical documents that require public scrutiny. If BOEM or any other cooperating agency, such as the U.S. Army Corps of Engineers, relies on the DEIS in its current form, any decision the agency makes will be arbitrary, capricious, and contrary to law.	environmental impacts used for this federal action in accordance with NEPA requirements and other regulatory frameworks. Chapter 2 of the EIS provides information on how alternatives were scoped, including scoping meetings for public involvement. Chapter 3 of the EIS identifies the affected environment, including as it relates to cultural resources and historic properties, provides the basis for IPFs for affected resources, and analyzes impacts; (2) direct, indirect, and cumulative effects of Sunrise Wind and other reasonably foreseeable wind farms is analyzed with the Final EIS; (3) BOEM is addressing all of the regulatory requirements of the NHPA Section 106 process, including NEPA substitution, as it proceeds through the NEPA analyses; (4) BOEM is fulfilling its responsibilities to give a higher level of consideration to minimizing harm to NHLs, as required by NHPA Section 110(f), through the implementation of the special requirements outlined at 36 *CFR* 800.10 (BOEM 2021). BOEM will continue consulting with the NPS, Advisory Council on Historic Preservation, and other consulting parties to further minimize harm to NHLs and the resolution of adverse effects to historic properties; and (5) BOEM has handled all of the critical documents appropriately.
BOEM-2022-0071-0249-0003	BOEM has failed to uphold its obligations to properly inform the public in the DEIS and through public meetings about the full range of Sunrise Wind's anticipated effects as NEPA requires. NEPA is designed to ensure that the public and decision-makers are	The EIS document provides a detailed description of the impacts of the Project. The EIS Introduction and Sections 1.5 and 1.6 provide the methodology for assessing the environmental impacts used for this federal action in accordance with NEPA requirements and other

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	provided with the information they need to make a considered decision about the best path forward. The statute is also designed to ensure that federal agencies have carefully and fully contemplated the environmental effects of a proposed action. In addition to considering impacts on the natural environment, NEPA requires federal agencies to consider impacts on historic and cultural resources. By focusing the permitting agency's attention on the environmental consequences of its proposed action, NEPA "ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast." In other words, NEPA requires that federal agencies take a "hard look" at the environmental consequences of a proposed action. In addition to assessing all impacts to the natural environment, BOEM must fully assess and consider all direct, indirect, and cumulative impacts on cultural and historic resources. But the DEIS falls short of NEPA mandates that require consideration of all adverse effects because BOEM has failed to integrate properly its NEPA and NHPA reviews, preferring instead to integrate in name only, but not in substance. BOEM has not taken a hard look at Sunrise Wind, but rather has placed its thumb on the scale in favor of granting approval by considering only alternatives that could best be described as supporting Sunrise Wind's preferences. The Newport Parties and Block Island Parties are longstanding stewards of some of the	regulatory frameworks. Chapter 2 of the EIS provides information on how alternatives were scoped, including scoping meetings for public involvement. Chapter 3 of the EIS identifies the affected environment, including as it relates to cultural resources and historic properties, provides the basis for IPFs for affected resources, and analyzes impacts. BOEM is addressing all of the regulatory requirements of the NHPA Section 106 process, including NEPA substitution, as it proceeds through the NEPA analyses. BOEM informed the public and all NHPA Section 106 consulting parties (that would use the NEPA process) to substitute for the steps in the Section 106 process when it releases the NOI for the Project. BOEM has engaged in, currently engages in, and will continue to engage in consultation with Tribal Nations, State Historic Preservation Offices (SHPOs), the Advisory Council on Historic Preservation (ACHP), and other consulting parties involved in historic preservation within the development areas. BOEM's historic preservation specialists have conducted technical sufficiency reviews of all cultural resource studies conducted by the Lessee to identify historic properties. BOEM historic preservation specialists have determined that the cultural resources investigations performed by the Lessee were aligned with relevant BOEM and state requirements for cultural resources investigations; employed technically sound methodologies; and were conducted by qualified professionals that meet or exceed the Secretary of the Interior's qualifications. BOEM provided comments on these documents and requests

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	nation's most significant historic and cultural resources, yet BOEM refuses to consider the unique history of their communities or consider adequately the Project's specific impacts to these communities, including harm to their tourism economies, their financial well-being, and greater sensitivity that heritage tourists have to the loss of historic character and context.	for additional information as needed and after careful review ultimately determined that the efforts to identify historic properties within the onshore, offshore, and visual Area of Potential Effects (APE) met the reasonable and good faith standard as described in 36 *CFR* 800.4 (b)(1) and in the ACHP's published guidance titled Meeting the "Reasonable and Good Faith" Identification Standard in Section 106 Review. Using the information provided in the cultural resource investigation reports, BOEM historic preservation specialists assessed potential adverse effects to historic properties following the process outlined in 36 *CFR* 800.5. Through their independent review, the BOEM historic preservation specialists determined that approval of the SRWF COP would result in adverse effects to historic properties. BOEM summarized the results of its review in a Finding of Adverse Effect that was shared with consulting parties on December 16, 2022. Through these efforts and the analysis conducted as part of the NEPA review, it is BOEM's opinion that it examined, in detail, the impacts to historic and cultural resources and has applied the Criteria of Adverse Effect as described in 36 *CFR* 800.5 (a). While assessing adverse economic impacts to historic and cultural resources is not required under NEPA or the NHPA, an assessment of potential economic impacts to tourism and recreation can be found in Section 3.21 of the Final EIS.

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BOEM-2022-0071-0249-0004	For example, although the DEIS notes that the "setting of recreation and tourism is highly dependent upon the viewscape of the area," the DEIS does not contemplate the effect of the wind turbine generators (WTGs) on Block Island's and Newport's tourism economies—or the effect that Sunrise Wind will have on historic properties within these communities that depend on visitor revenue—from adverse visual effects other than to dismiss the risk. To the extent that the DEIS suggests that industrial-scale visual turbine blight would benefit historic communities, our clients object. BOEM's conclusion is not supported by credible research.	Comment acknowledged. EIS Section 3.16 assesses impacts from the Proposed Action and the NEPA alternatives on the local economy, while EIS Section 3.21 assess impacts on recreation and tourism.
BOEM-2022-0071-0249-0007	Multiple wind farms are in development off the coasts of Rhode Island and adjacent states. These offshore wind projects will have both separate and cumulative adverse visual impacts upon historic properties, sites, and districts listed or eligible for listing in the National Register of Historic Places. DEIS, This Project, and how it is evaluated and permitted, will set a precedent for upcoming projects in the area and along the entire Atlantic Coast; therefore, it is essential to apply consistent criteria to this project and subsequent future sites.	The EIS analyzes the cumulative impacts of the Project in relation to other reasonably foreseeable future offshore wind projects. These analyses specifically include cumulative analysis of adverse effects from visual impacts to aboveground historic properties (also referred to as National Register of Historic Places (NRHP)-eligible viewshed resources). BOEM's 2020 Guidelines for Providing Archaeological and Historical Property Information Pursuant to 30 *CFR* Part 585 and BOEM's 2021 Assessment of SLVIA of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States were followed in the compilation of the Historic Resources Visual Effects Analysis (HRVEA) and CHRVEA that this EIS references and are being used consistently across BOEM project documents.

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BOEM-2022-0071-0249-0008	Due to the historic integrity of historic properties within the Project Area and Area of Potential Effects, BOEM must establish and implement best practices. Based on the omissions described above, the DEIS should be amended to reflect—and the Final EIS should include—a complete cumulative assessment of all impacts to historic and cultural properties and include additional cumulative visual simulations for the Town of New Shoreham's and City of Newport's historic properties, including those reasonably foreseeable effects that adjacent wind farms will generate.	In the CHRVEA and BOEM's Finding (see EIS Appendix J), BOEM applies the criteria of adverse effect (at 36 *CFR* 800.5) in considering cumulative effects to all historic properties in the APE. BOEM has determined that only when the Project has adverse visual effects would the Project incrementally contribute to cumulative adverse effects. Visual adverse effects from the Project, and consequently cumulative adverse effects, were determined at 47 aboveground historic properties that are analyzed in the CHRVEA. BOEM maintains that the visualizations prepared for the Project VIA, HRVEA, CHRVEA, and National Historic Landmark (NHL) supplementation documentation present a broad range of lighting and atmospheric conditions appropriate to assess the potential visual effects to historic properties located in the APE. BOEM finds the documentation acceptable and sufficient to enable any reviewing parties to understand the basis of BOEM's determinations and findings on the undertaking under NHPA Section 106 (per 36 *CFR* 800.11 (a)).
BOEM-2022-0071-0249-0011	Section 106 of the National Historic Preservation Act (NHPA) requires BOEM to address impacts to historic properties and find ways through consultation to avoid, minimize, or mitigate adverse effects. As part of the federal government's policy of protecting the nation's historic heritage and sense of orientation as an American people, Section 106 requires federal agencies to consider the effects on historic properties of projects they carry out, assist, fund, permit, license, or approve throughout the country.	BOEM has notified the NPS, as a delegate of the Secretary of the Interior, and the Advisory Council on Historic Preservation (ACHP) of BOEM's determination of adverse effect to NHLs with the distribution of BOEM's Finding of Adverse Effect (the Finding). BOEM provided the Findings to the NPS, ACHP, and other NHPA consulting parties on December 16, 2022. The ACHP and NPS have been active consulting parties on the Project since BOEM invited them to consult at the initiation of the NHPA Section 106 process upon the Project's Notice

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	If a federal or federally-assisted project has the potential to affect historic properties listed or determined eligible for listing in the National Register of Historic Places, a Section 106 review is required.12 During Section 106 review, once historic properties have been identified in coordination with the applicable State Historic Preservation Officer, the federal agency charged with permitting the proposed project must find ways to avoid, minimize, or mitigate adverse effects to those properties in consultation with parties who have a demonstrated interest in the undertaking. Moreover, BOEM must undertake all possible planning to minimize harm to all adversely affected National Historic Landmarks, pursuant to Section 110(f) of the NHPA.14 This has not occurred. Section 110(f) provides: Prior to the approval of any Federal undertaking which may directly and adversely affect any [NHL], the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark, and shall afford the Advisory Council a reasonable opportunity to comment on the undertaking. Notwithstanding Section 110(f)'s mandate, as discussed below BOEM has not demonstrated compliance with the heightened level of scrutiny that Section 110(f) requires.	of Intent on August 31, 2021. BOEM is fulfilling its responsibilities to give a higher level of consideration to minimizing harm to NHLs, as required by NHPA Section 110(f), through the implementation of the special requirements outlined in 36 *CFR* 800.10. BOEM provided NHL supplemental documentation for the Project, which includes additional visualizations of offshore wind facilities in relation to each of the NHLs in the APE, to consulting parties on December 16, 2022. As noted in BOEM's documentation, Project alternatives are able to avoid adverse effects on seven of the eleven NHLs in the APE and have considered various factors in minimizing adverse effects to the four remaining NHLs, in addition to proposing mitigation measures in the MOA. BOEM is taking into account all prudent and feasible measures proposed by consulting parties to avoid, minimize, and mitigate adverse effects on NHLs. BOEM remains in consultation with consulting parties to finalize these measures and implement them under the MOA. Where adverse effects would remain, BOEM would refine, through consultation, minimization measures to the maximum extent feasible and further develop mitigation measures of adverse effects that remain at the four NHLs after the application of minimization efforts. BOEM would identify and finalize mitigation measures specific to each NHL with the consulting parties through the development of the MOA. Mitigation measures for adverse effects on NHLs must be reasonable in cost and not be determined using inflexible criteria, as described by the NPS (2021b). Mitigation of adverse effects on the

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		four NHLs would meet the following requirements: • Reflect the heightened, national importance of the property and be appropriate in magnitude, extent, nature, and location of the adverse effect; • Focus on replacing lost historic resource values with outcomes that are in the public interest, such as through development of products that convey the important history of the property; and • Comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (NPS 2017).
BOEM-2022-0071-0249-0012	The documents BOEM provided for review, as drafted, fall short of the NHPA's mandates that require consideration and resolution of all adverse effects. By contrast, BOEM downplays them. In reviewing Sunrise Wind's visual simulations, our clients have serious concerns regarding the assessment of adverse effects to these properties. Without additional visualizations to and from historic properties, including all NHLs, consulting parties cannot understand how Sunrise Wind and projects cumulative to Sunrise Wind will affect their historic properties' integrity, including their context, seaside character, and connection to a maritime setting that has historically depended on open views to and from the Atlantic Ocean. The number and density of Sunrise Wind's turbines will create a visual mass that will have a presence of large-scale modern infrastructure on the horizon that cannot	BOEM has determined that the visual simulations prepared by the Lessee are adequate for assessing visual impacts. COP Appendix Q1 (EDR 2022), *Visual Impact Assessment*, further outlines the methodology for developing the simulations as part of the technical report and subsequent findings. The current visual simulations sufficiently demonstrate the visibility of the proposed Project structures from the selected KOPs. BOEM has determined that the visualizations prepared for the Project VIA, HRVEA, CHRVEA, and NHL supplementation documentation present a broad range of lighting and atmospheric conditions appropriate to assess the potential visual effects on historic properties located in the APE. BOEM finds the documentation acceptable and sufficient to enable any reviewing parties to understand the basis of BOEM's determinations and findings on the undertaking under NHPA Section 106 (per

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	be avoided.	36 CFR 800.11(a)). BOEM follows all applicable laws on the Project, including those described in the regulatory framework in EIS Section 1.3. BOEM does not find the HRVEA and supporting VIA visualizations to underrepresent the size or number of WTGs. Numerous visualizations are provided in the VIA, HRVEA, and CHRVEA for a range of high-contrast conditions from various KOPs. It is neither feasible nor required to simulate all potential viewing conditions for BOEM to determine whether individual historic properties would be adversely affected and to accurately characterize the nature of any such adverse effects. The KOPs were selected to provide a range of vantages and elevations (e.g., bluffs, coastlines, landscape features) with unobstructed views toward the Project and, therefore, represent views with the greatest scope of change from existing conditions. The visualizations presented in the HRVEA were created methodically to accurately characterize views of the Project from representative viewpoints throughout the APE. Consistent with BOEM's guidance and extensive analyses of visual effects conducted over the previous decade on offshore wind facilities, the VIA and HRVEA contain extensive field photography and visualizations to accurately depict how the Project would appear from vantages throughout the APE. The Project visualizations have been prepared by qualified consultants and reviewed by BOEM's visual and Section 106 subject matter experts, to best support robust and accurate characterization of Project visibility. BOEM is uniquely

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		experienced in preparing and evaluating visual studies for offshore wind facilities, and has consistently moved to incorporate best practices from ongoing research. BOEM's guidance and requirements are applied sufficiently in the HRVEA, CHRVEA, and VIA for the Project. BOEM's review and consultation on the Project remain ongoing, and BOEM welcomes continued input that will improve its NHPA Section 106 and other regulatory reviews and consultation. Please note that simulations and visualizations are only one supporting aspect of BOEM's analyses for adverse effects to historic properties, including NHLs and Traditional Cultural Properties (TCPs) important to Tribal Nations, and not the entire basis of the assessment of effects. The VIA and HRVEAs for the Project provide detail on the fuller contexts of the visual impacts analyses.
BOEM-2022-0071-0249-0013	However, BOEM cannot reasonably expect consulting parties to understand the full extent of Sunrise Wind's adverse visual effects. The visual simulations that BOEM has provided are too limited in nature and not only preclude meaningful consultation and resolution of adverse effects, but BOEM's continued reliance on them will result in decision making that is arbitrary, capricious, and contrary to law. Because current visual assessments and simulations do not show the actual impact of the Sunrise Wind's turbines and associated infrastructure, BOEM must amend them to assess adverse impacts and to determine appropriate avoidance, minimization, or mitigation measures.	BOEM has determined that the visual simulations prepared by the Lessee are adequate for assessing visual impacts. COP Appendix Q1, *Visual Impact Assessment,* further outlines the methodology associated with the development of the simulations as part of the technical report and subsequent findings. The current visual simulations sufficiently demonstrate the visibility of the proposed Project structures from the selected KOPs. BOEM has determined that the visualizations prepared for the Project VIA, HRVEA, CHRVEA, and NHL supplementation documentation present a broad range of lighting and atmospheric conditions appropriate to assess the potential visual effects on historic properties

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		located in the APE. BOEM finds the documentation acceptable and sufficient to enable any reviewing parties to understand the basis of BOEM's determinations and findings on the undertaking under NHPA Section 106 (per 36 *CFR* 800.11(a)). BOEM follows all applicable laws on the Project, including those described in the regulatory framework in EIS Section 1.3. BOEM does not find the HRVEA and supporting VIA visualizations to underrepresent the size or number of WTGs. Numerous visualizations are provided in the VIA, HRVEA, and CHRVEA for a range of high-contrast conditions from various KOPs. It is neither feasible nor required to simulate all potential viewing conditions for BOEM to determine whether individual historic properties would be adversely affected and to accurately characterize the nature of any such adverse effects. The KOPs were selected to provide a range of vantages and elevations (e.g., bluffs, coastlines, landscape features) with unobstructed views toward the Project and, therefore, represent views with the greatest scope of change from existing conditions. The visualizations presented in the HRVEA were created methodically to accurately characterize views of the Project from representative viewpoints throughout the APE. Consistent with BOEM's guidance and extensive analyses of visual effects conducted over the previous decade on offshore wind facilities, the VIA and HRVEA contain extensive field photography and visualizations to accurately depict how the Project would appear from vantages throughout the APE. The Project visualizations

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		have been prepared by qualified consultants, and reviewed by BOEM's visual and Section 106 subject matter experts, to best support robust and accurate characterization of Project visibility. BOEM is uniquely experienced in preparing and evaluating visual studies for offshore wind facilities, and has consistently moved to incorporate best practices from ongoing research. BOEM's guidance and requirements are applied sufficiently in the HRVEA, CHRVEA, and VIA for the Project. BOEM's review and consultation on the Project remain ongoing, and BOEM welcomes continued input that will improve its NHPA Section 106 and other regulatory reviews and consultation. Please note that simulations and visualizations are only one supporting aspect of BOEM's analyses for adverse effects to historic properties, including NHLs and TCPs important to Tribal Nations, and not the entire basis of the assessment of effects. The VIA and HRVEAs for the Project provide detail on the fuller contexts of the visual impacts analyses.
BOEM-2022-0071-0249-0015	BOEM expects consulting parties to guess at what visual simulations would look like to and from Newport's and Block Island's historic properties. For example, BOEM has submitted visual simulations from the Newport Cliff Walk and the Southeast Lighthouse, but not from the Bellevue Avenue Historic District or Ocean Drive Historic District.16 And for the visual simulations that BOEM has submitted, such as the Newport Cliff Walk, New Shoreham Beach, Clayhead Trail, or Mohegan	BOEM maintains that the visualizations prepared for the Project VIA, HRVEA, CHRVEA, and NHL supplementation documentation present a broad range of lighting and atmospheric conditions appropriate to assess the potential visual effects to historic properties located in the APE. BOEM finds the documentation acceptable and sufficient to enable any reviewing parties to understand the basis of BOEM's determinations and findings on the undertaking under NHPA Section 106 (per 36 *CFR* 800.11

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	Bluffs, wind turbines are not shown at full contrast such as they would appear during sunrise and sunset. Nor has BOEM has prepared a visual simulation from The Breakers or Marble House even though they are designated as individual NHLs. These oversights are surprising considering BOEM's duty to assess adverse effects on all historic properties. Moreover, failure to include visual simulations from all NHLs is evidence of not using all possible planning to minimize harm.	(a)).
BOEM-2022-0071-0249-0020	In addition, considering the magnitude of Sunrise Wind's adverse effects on the landscape and visual blight Sunrise Wind will cause, BOEM should consider Newport County's and Block Island's historic landscapes for eligibility as traditional cultural properties so that BOEM can assess adverse effects more accurately, rather than downplaying them. The historic properties located in these extraordinarily well-preserved places maintain ties to living communities who continue to preserve, maintain, and associate these properties with cultural practices, traditions, lifeways, and social institutions—many of which are located with NHL districts or as individually designated NHLs, such as the Southeast Lighthouse—and who continue to appreciate, occupy, and use these properties.	BOEM appreciates the comment. Table 3.15-5 in the Final EIS summarizes work completed to identify historic properties within the HRVEA's APE. This includes 150 properties in Rhode Island, most of which are in Newport and Block Island. The HRVEA identifies adverse effects on 29 of the 150 historic properties in Rhode Island. These include two NHL districts and one individual NHL in Newport. On Block Island, this includes multiple historic districts and individual properties along the coast, with the districts representing residential, commercial, agricultural, and military themes, along with cultural landscapes. The previously identified districts included in the HRVEA and CHRVEA evaluations cover themes mentioned in this comment. Based on the properties evaluated, and the adverse effects recommendations for those properties, BOEM believes that the significant landscapes in this comment have been included in the analysis and adverse effects have been appropriately identified. If Cultural Heritage Partners and its clients do not agree that the landscapes are adequately accounted for, BOEM would encourage Cultural Heritage Partners

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		and its clients to draft a proposal for evaluating Newport County's and Block Island's historic landscapes for eligibility on the NRHP as traditional cultural properties and to resolve adverse effects to historic properties within those landscapes. The recommended study would add to our knowledge of the interrelationships between individual properties and the larger landscape. An integrated assessment of the Newport County and Block Island historic landscapes, if determined eligible, could allow for better assessment of potential adverse effects during future National Historic Preservation Act Section 106 reviews of federal undertakings.
BOEM-2022-0071-0249-0021	Descriptions about Newport and Block Island are illustrative of the traditional, historic relationship of these communities to their pristine ocean settings and the connections living communities continue to have to their settings and celebrate. BOEM, however, has not explored these connections and thus not provided the deeper level of historic property identification and analysis that Newport and Block Island merit.	To support the identification of historic properties within the APE, BOEM has reviewed the findings of historic resources visual investigations conducted by the SRWF Lessee. The Lessee has submitted reports prepared for Sunrise Wind by EDR, including the Onshore Above-ground Historic Properties Report and Desktop Research conducted for the HRVEA for the WTGs and OCS-DC. The reports provided information for 307 above-ground historic resources within the Preliminary Area of Potential Effects (PAPE) previously identified as viewshed resources for field reconnaissance survey and viewshed analysis of the APE for onshore Project components. Investigations were aligned with relevant BOEM and state survey guidelines, and requirements. BOEM conducted technical sufficiency reviews of these documents to determine if the cultural resources investigations performed by the Lessee were aligned with relevant BOEM and state requirements, employed

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		technically sound methodologies, and whether BOEM concurred with the findings/recommendations of the report authors. BOEM provided comments on these documents and submitted requests for additional information as needed. After careful review, BOEM determined that the efforts to identify historic properties within the onshore, offshore, and visual APE met the reasonable and good faith standard as described in 36 *CFR* 800.4 (b)(1) and in the Advisory Council on Historic Preservation's published guidance titled Meeting the "Reasonable and Good Faith" Identification Standard in Section 106 Review. BOEM determined that each of the studies summarized above was logically designed to identify eligible properties that could be affected by the undertaking, without being excessive or inadequate. Properties were identified based on previous planning, research and studies, the magnitude and nature of the undertaking, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties within the APE. Each study adequately investigated the horizontal and vertical limits of their respective APE, effectively utilized previous studies/investigations to develop investigation plans, and were aligned with relevant federal and state investigation standards, previous investigations, and best practice. BOEM determined that the investigations were designed and carried out by qualified individuals who met or exceeded the Secretary of the Interior's qualifications for cultural resources professionals, and that said investigations were appropriate to the nature and scale

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		of the undertaking. As a result of these reviews, BOEM determined that the cultural resource investigations conducted by SRWF meet the reasonable and good faith standard to identify historic properties.
BOEM-2022-0071-0249-0024	Going forward in revising Sunrise Wind's DEIS and technical reports, BOEM must employ common sense in its assessment of Newport's and Block Island's historic properties' character and setting, and work closely with consulting parties (as opposed to consultants) to understand how people in these communities—including historic property owners who were never notified about this permitting process— interact with these properties and how Sunrise Wind will adversely affect these properties individually and cumulatively.	Throughout the NHPA Section 106 consultation, BOEM has sought to involve the public per the requirements of 36 *CFR* 800.2. On August 4, 2021 BOEM invited over 115 potential consulting parties to participate in the NHPA Section 106 review of the SRWF undertaking. Throughout the NHPA Section 106 review, BOEM has added consulting parties that have demonstrated interest in the undertaking and have requested to participate, including federally recognized Tribal Nations, state or historical tribal governments, local governments, nongovernment organizations, and property owners. BOEM further welcomed recommendations from invited consulting parties on any organizations, local governments, or members of the public they believed BOEM should include in the consultation process as per 36 *CFR* 800.3(f). In addition, per the processes and procedures outlined at 36 *CFR* Part 800.2 (d)(3) and 36 *CFR* Part 800.8, BOEM utilized the NEPA Public Scoping meetings held on September 16, 20, and 22, 2021 and the Draft EIS public comment meetings held on January 18, 19, and 23, 2023 to provide members of the public, including historic property owners, with an opportunity to comment on the identification of historic properties, potential adverse effects to historic properties, BOEM's determination of adverse effects, and propose methods to avoid, minimize, and/or mitigate adverse effects to historic

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		properties. BOEM will continue to consider, and add as appropriate, additional consulting parties who request to participate as the NHPA Section 106 process proceeds under NEPA and the NHPA.
BOEM-2022-0071-0249-0025	As evidence of BOEM's skipping steps in the Section 106 and NEPA process, BOEM has submitted to consulting parties a draft Memorandum of Agreement (MOA) before consulting parties have had an opportunity to conclude consultation with BOEM on earlier steps in the Section 106 process.	The regulations for NHPA Section 106 coordination with NEPA require that BOEM, in consultation with identified consulting parties, develop alternatives and proposed measures that might avoid, minimize, or mitigate any adverse effects of the undertaking on historic properties and describe them in the Draft EIS. Under 36 *CFR* 800.8(c), for NEPA substitution, BOEM is required at the Draft EIS stage to identify and describe the proposed measures to resolve any adverse effects to historic properties. These measures were included in the Draft EIS to provide the opportunity for the public to review them. BOEM provided consulting parties under Section 106 the opportunity to review the draft MOA prior to its public release. The draft MOA in Draft EIS Appendix J is among the documentation in the Draft EIS that describes the measures for treating adverse effects on historic properties. BOEM proceeded with the development of these draft measures in consultation with the NHPA Section 106 consulting parties on the Project before the issuance of the Draft EIS and looks forward to receiving further input on the MOA from the consulting parties. This included the consideration and further consultation about additional mitigations proposed by consulting parties.
BOEM-2022-0071-0249-0026	Suggested minimization measures do not qualify as such. Moreover, the MOA has proposed mitigation	BOEM continues to seek input from consulting parties on measures to avoid, minimize, and/or mitigate adverse

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	measures to resolve adverse effects that are not adequate, have not been requested, and do not offset the magnitude of harm that Sunrise Wind will cause. BOEM's message to consulting parties is that whatever Sunrise Wind wants is a fait accompli and whatever consulting parties want does not matter.	effects for inclusion in the draft MOA.
BOEM-2022-0071-0249-0027	Moreover, our clients object to the draft MOA and proposed mitigation plans since they do not meet the standard needed for mitigation to offset unavoidable adverse effects and fail to consider the creation of appropriately capitalized historic preservation mitigation funds. Nevertheless, so that all consulting parties can understand the basis of Sunrise Wind's mitigation proposals, and so that future consultation can be productive, we request copies before the next consultation meeting of all documents on which Sunrise Wind and BOEM have relied to show that the existing mitigation proposals are the result of all possible planning to minimize harm. This information is also needed to understand how Sunrise Wind's proposed mitigation proposals rise to a level of "rough proportionality" relative to Sunrise Wind's adverse effects and which would be required to offset those effects.	BOEM continues to seek input from consulting parties on measures to avoid, minimize, and/or mitigate adverse effects for inclusion in the draft MOA.
BOEM-2022-0071-0249-0028	Consultation is the process of "seeking, discussing and considering the views of other participants, and where feasible, seeking agreement with them regarding matters arising in the Section 106 process." Done correctly, consultation presents opportunities for the development of creative and innovative measures for	BOEM continues to seek input from consulting parties on measures to avoid, minimize, and/or mitigate adverse effects for inclusion in the draft MOA. BOEM encourages Cultural Heritage Partners and its clients to submit additional proposals to resolve adverse effects on historic properties as BOEM and consulting parties work to draft

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	the resolution of adverse effects. However, BOEM and Sunrise Wind's reliance on undefined mitigation measures in the draft MOA is not a workable solution, especially where BOEM and Sunrise Wind refuse to address our clients' concerns.	and finalize the MOA.
BOEM-2022-0071-0249-0029	BOEM's Draft MOA has proposed the following mitigation measures, the gist of which includes: Undefined and unfunded assessments, feasibility studies, preparation of nominations for the National Register of Historic Places, and public interpretation of coastal hazards and climate change risks for unspecified historic properties; • Undefined mitigation measures and no funding specified for Block Island's historic properties other than a statement that Sunrise Wind "will fund fulfillment mitigation measures"; • a referenced but missing historic preservation treatment plan for the Southeast Lighthouse NHL; and • Nothing specifically dedicated to any of the NHLs or other historic properties under the jurisdiction, stewardship, or ownership of the Newport Parties, an astounding omission.	BOEM continues to seek input from consulting parties on measures to avoid, minimize, and/or mitigate adverse effects for inclusion in the draft MOA.
BOEM-2022-0071-0249-0030	Sunrise Wind's proposals do not amount to acceptable mitigation for at least twenty-five to thirty years of harm to Newport's and Block Island's historic context, the risk that Sunrise Wind might never be decommissioned, and the indirect and cumulative financial harm our clients' historic properties are	BOEM is preparing proposed mitigation measures to address visual adverse effects to historic properties. These will be presented in Historic Properties Treatment Plans (HPTPs) attached to the draft MOA (EIS Appendix J, Attachment 4), and will be consistent with the scale, nature, and range of those approved by BOEM for other

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	expected to experience.	offshore wind development projects in the vicinity, including the Vineyard Wind I and South Fork Wind Farm, through the NHPA Section 106 consultation process. All of these measures will take into account information BOEM has received in consultation under NEPA and NHPA Section 106, weighing information from past as well as current projects. BOEM looks forward to refining the proposed mitigation measures as part of ongoing consultation in the NHPA Section 106 process. Through consultation, BOEM will work to adapt and finalize the resolution of adverse effects in a revision of the MOA and its attached HPTPs. NHPA Section 106 has no proportionality requirement for the mitigation of adverse effects. The regulations for NHPA, at 36 *CFR* 8090.6, provide procedures for resolving adverse effects, including for continued consultation and MOA preparation, and do not set requirements regarding the substance of mitigation. The NPS (2021b) in their non-regulatory guidance on Section 110(f), for NHLs, notes that Project alternatives must be prudent and feasible for an undertaking and consider "(1) the magnitude of the undertaking's harm to the historical, archaeological and cultural qualities of the NHL; (2) the public interest in the NHL and in the undertaking as proposed, and (3) the effect a mitigation action would have on meeting the goals and objectives of the undertaking." BOEM's Finding and draft MOA consider these matters.
BOEM-2022-0071-0249-0031	As our clients have already explained, a sufficiently capitalized historic preservation mitigation fund tailored to each community, which consulting parties	BOEM appreciates the recommendation for a historic preservation mitigation fund to resolve adverse effects on historic properties. BOEM continues to seek input

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	can deploy for needed historic preservation and coastal resiliency purposes to protect their historic properties, is the most appropriate and efficient way to offset Sunrise Wind's adverse effects that cannot be avoided.	from consulting parties on measures to avoid, minimize, and/or mitigate adverse effects for inclusion in the draft MOA. BOEM encourages Cultural Heritage Partners and its clients to submit additional proposals to resolve adverse effects on historic properties as BOEM and consulting parties work to draft and finalize the MOA.
BOEM-2022-0071-0249-0032	Therefore, our clients object globally to the proposed mitigation offers that have not developed through consultation. What BOEM has apparently endorsed undermines Section 106's legitimacy. Moreover, Sunrise Wind's proposals are essentially meaningless and discount the value property owners and historic preservation advocates—including local governments—place on their historic oceanfront settings.	BOEM continues to seek input from consulting parties on measures to avoid, minimize, and/or mitigate adverse effects for inclusion in the draft MOA. BOEM encourages Cultural Heritage Partners and its clients to submit additional proposals to resolve adverse effects on historic properties as BOEM and consulting parties work to draft and finalize the MOA.
BOEM-2022-0071-0249-0034	Finally, BOEM cannot demonstrate that it has complied with Section 110(f) of the NHPA. As noted above, BOEM's visual simulations are not adequate and ignore all but one of our clients' NHLs. BOEM has not prepared enough of them during different seasons and times of day for consulting parties to consider them as representative samples for understanding the adverse effects of Sunrise Wind and cumulative offshore wind developments.	BOEM maintains that the visualizations prepared for the Project VIA, HRVEA, CHRVEA, and NHL supplementation documentation present a broad range of lighting and atmospheric conditions appropriate to assess the potential visual effects to historic properties located in the APE. BOEM finds the documentation acceptable and sufficient to enable any reviewing parties to understand the basis of BOEM's determinations and findings on the undertaking under NHPA Section 106 (per 36 *CFR* 800.11 (a)).
BOEM-2022-0071-0249-0039	Here, BOEM has violated Section 304 by applying it in a blanket fashion to classify as confidential information that the public is entitled to see and that does not trigger Section 304's application. BOEM also did not comply with the procedural requirements of Section 304 in deciding to classify documents associated with	The sensitive information on historic properties that was either summarized in publicly available documents or redacted from public documents is information that relates to the ownership, character, and location of historic properties that are not necessarily of public record, particularly archaeological sites and sites of

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	Sunrise Wind, its adverse effects, and how Sunrise Wind intends to resolve them since it apparently never consulted with the National Park Service or ACHP for guidance on the issue. The following list of inappropriately classified documents is illustrative: Marked "Confidential" in DEIS • Appendix J: Finding of Adverse Effect for Historic Properties and Draft Memorandum of Agreement • Attachment B - Map Figures of Historic Properties in Relation to the APE	traditional religious and cultural significance to Tribal Nations. While BOEM shared complete, unredacted versions of all documentation with consulting parties for their review, BOEM did not publicly provide full versions of all Section 106-related documentation to the general public. However, BOEM did make public summaries or redacted versions of all such documentation to facilitate public involvement in the Section 106 process and comment on the Draft EIS. BOEM has consulted with the Advisory Council on Historic Preservation and coordinated with the NPS about a plan on how to handle sensitive information potentially subject to Section 304 of the NHPA. BOEM has not yet formally initiated the Section 304 consultation pursuant to 36 *CFR* 800.11(c) for the Section 106 consultation on the Project. The NPS has informed BOEM that the Section 304 regulations of the NHPA do not specify when or if an agency is required to initiate consultation with the Secretary of the Interior within the course of an ongoing Section 106 consultation. In addition, the NPS advised BOEM that it is acceptable for a federal agency to wait to disclose project findings to the public until identification of historic properties, including sites of religious and cultural significance to Tribal Nations, and until potential effects to these properties have concluded and consensus evaluations of NRHP eligibility have been completed. From the beginning of the Section 106 consultation for the Project, BOEM has planned to distribute these reports that contain sensitive information to the

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		consulting parties and to post publicly available summaries or redacted versions of Section 106-related documents to BOEM's website. The consulting parties have received all the available information and documentation associated with this Section 106 consultation, including sensitive information that could be subject to Section 304. The basis for withholding from the public the revised technical reports (reports associated with the preparation of the Draft EIS) as opposed to redacting sensitive portions and making the documents public is as follows. The documents could contain sensitive information that could be subject to Section 304 of the NHPA. We have publicly available summaries of the revised technical reports—the marine archaeological resources assessment (MARA), terrestrial archaeological resources assessment (TARA), and offshore historic resources visual effects analyses (HRVEA)—posted to BOEM's website for the Project (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-construction-and-operation-plan). These summaries were posted shortly after the Project's Draft EIS was made publicly available. The CHRVEA is available on BOEM's website for this Project under the visual simulations tab (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind). The Draft EIS contains BOEM's Finding and draft MOA with certain sensitive information redacted. The Finding in the Draft EIS includes information regarding how BOEM has delineated its APE for the Project. All

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		consulting parties received unredacted copies of the MARA, TARA, HRVEA, memorandum on the updated HRVEA (offshore), CHRVEA, and memorandum on BOEM's APE delineation. The basis for making confidential the Finding and draft MOA and redacting sensitive portions of the documents for the public is as follows. As noted above, the Draft EIS Appendix J (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-draft-environmental-impact-statement-deis-commercial) contains the Finding of Effect and the draft MOA with certain sensitive information redacted (i.e., on the character and location of archaeological and tribal historic properties). BOEM made these documents available to the public when the Draft EIS was published. The consulting parties received unredacted versions of the MARA, TARA, HRVEA, Finding of Adverse Effect, and draft MOA on December 16, 2022, which contain all the redacted information in the public versions of these documents. The basis for making confidential the summary and recordings of the prior two Section 106 meetings (as opposed to redacting sensitive portions and making the summary and recordings public) is as follows. The Section 106 meeting summaries and recordings contain sensitive information that could be subject to Section 304 of the NHPA. BOEM plans to produce redacted versions of the meeting summaries once we initiate Section 304 consultation with the NPS and the Advisory Council on Historic Preservation. BOEM disagrees with the assertion of other consulting parties that the Section 106

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		consultation cannot proceed until the NPS is consulted with and redactions are applied to reports that contain sensitive information. As explained above, the regulations implementing Section 304 do not specify when an agency must begin consulting with the NPS. In summary, all consulting parties have received all available information and documentation associated with this Section 106 consultation, including sensitive information that could be subject to Section 304, and BOEM's website contains either redacted versions of consultation-related documents or non-technical summaries of reports that contain sensitive information.
BOEM-2022-0071-0249-0043	We have reviewed BOEM's documents marked as confidential. Contrary to BOEM's assertions, and except for any documents or portions of documents that Tribes do not want disclosed due to their cultural sensitivity, they do not appear to contain trade secrets or privileged confidential commercial or financial information. Therefore, it is not appropriate for BOEM to keep the public from reviewing these documents by erroneously exempting them from disclosure. To correct this error, which has interfered with our ability to share BOEM's documents with local government constituents and our clients' memberships, BOEM must comply with Section 304 of the NHPA, seek determinations from the NPS and ACHP, reissue the documents without illegal confidentiality classifications, and restart the review process for all the documents that BOEM inappropriately classified.	The sensitive information on historic properties that were either summarized in publicly available documents or redacted from public documents is information that relates to the ownership, character, and location of historic properties that are not necessarily of public record, particularly archaeological sites and sites of traditional religious and cultural significance to Tribal Nations. While BOEM shared complete, unredacted versions of all documentation with consulting parties for their review, BOEM did not provide full versions of all Section-106-related documentation to the general public. However, BOEM did make public summaries or redacted versions of all such documentation to facilitate public involvement in the Section 106 process and comment on the Draft EIS. BOEM has consulted with the Advisory Council on Historic Preservation and coordinated with the NPS about a plan to handle sensitive information potentially

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		subject to Section 304 of the NHPA. BOEM has not yet formally initiated the Section 304 consultation pursuant to 36 *CFR* 800.11(c) for the Section 106 consultation on the Project. The NPS has informed BOEM that the Section 304 regulations of the NHPA do not specify when or if an agency is required to initiate consultation with the Secretary of the Interior within the course of an ongoing Section 106 consultation. In addition, the NPS advised BOEM that it is acceptable for a federal agency to wait to disclose Project findings to the public until the identification of historic properties, including sites of religious and cultural significance to Tribal Nations, and until potential effects to these properties have concluded and consensus evaluations of NRHP eligibility have been completed. From the beginning of the Section 106 consultation for the Project, BOEM has planned to distribute these reports that contain sensitive information to the consulting parties and to post publicly available summaries or redacted versions of Section 106-related documents to BOEM's website. The consulting parties have received all the available information and documentation associated with this Section 106 consultation, including sensitive information that could be subject to Section 304. The basis for withholding from the public all of the revised technical reports (reports associated with the preparation of the Draft EIS) as opposed to redacting sensitive portions and making the documents public is as follows. The documents could contain sensitive information that could be subject to Section 304 of the NHPA.

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		We have publicly available summaries of the revised technical reports—the marine archaeological resources assessment (MARA), terrestrial archaeological resources assessment (TARA), and offshore historic resources visual effects analyses (HRVEA)—posted to BOEM's website for the Project (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-construction-and-operation-plan). These summaries were posted shortly after the Project's Draft EIS was made publicly available. The CHRVEA is available on BOEM's website for this Project under the visual simulations tab (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind). The Draft EIS contains BOEM's Finding and draft MOA with certain sensitive information redacted. The Finding in the Draft EIS includes information regarding how BOEM has delineated its APE for the Project. All consulting parties received unredacted copies of the MARA, TARA, HRVEA, memorandum on the updated HRVEA (offshore), CHRVEA, and memorandum on BOEM's APE delineation. The basis for making confidential the Finding and draft MOA and redacting sensitive portions of the documents for the public is as follows. As noted above, the Draft EIS Appendix J (https://www.boem.gov/renewable-energy/state-activities/sunrise-wind-draft-environmental-impact-statement-deis-commercial) contains the Finding of Effect and the draft MOA with certain sensitive information redacted (i.e., on the character and location of archaeological and tribal historic properties). BOEM

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		made these documents available to the public when the Draft EIS was published. The consulting parties received unredacted versions of the MARA, TARA, HRVEA, Finding of Adverse Effect, and draft MOA on December 16, 2022, which contain all the redacted information in the public versions of these documents. The basis for making confidential the summary and recordings of the prior two Section 106 meetings (as opposed to redacting sensitive portions and making the summary and recordings public) is as follows. The Section 106 meeting summaries and recordings contain sensitive information that could be subject to Section 304 of the NHPA. BOEM plans to produce redacted versions of the meeting summaries once we initiate Section 304 consultation with the NPS and the Advisory Council on Historic Preservation. BOEM disagrees with the assertion of other consulting parties that the Section 106 consultation cannot proceed until the NPS is consulted with and redactions are applied to reports that contain sensitive information. As explained above, the regulations implementing Section 304 do not specify when an agency must begin consulting with the NPS. In summary, all consulting parties have received all available information and documentation associated with this Section 106 consultation, including sensitive information that could be subject to Section 304, and BOEM's website contains either redacted versions of consultation-related documents or non-technical summaries of reports that contain sensitive information.

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BOEM-2022-0071-0205-0027	BOEM should also ensure that all impacted tribes are properly consulted, including state recognized tribes, and non-federally recognized tribes in a geographic analysis area that is representative of their historical presence in the region. Robust consultation with tribes should be extended to Project activities that take place out of the state or region	Thank you for your comment
BOEM-2022-0071-0242-0018	The construction and installation of wind turbine generators (WTGs), offshore substation, electrical support cables, operations and maintenance facilities, and port facilities as well as the development of staging areas are ground- or seabed-disturbing activities that could directly affect archaeological resources. Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to "take into account the effects of their undertakings on historic properties." It also gives the Advisory Council on Historic Preservation an opportunity to comment. The Section 106 process balances historic preservation concerns with the needs of federal agencies while involving interested parties. The DEIS notes that consultation is still ongoing and could influence potential mitigation measures. Robust consultation with states and tribes under Section 106 is paramount to ensuring the Project appropriately considers impacts on historic state and tribal resources. According to the DEIS, BOEM is consulting with the following tribes: the Mashantucket Pequot Tribal Nation, the Mashpee Wampanoag Tribe, The Delaware Nation, the Shinnecock Nation, and the Wampanoag	Thank you for your comment.

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	Tribe of Gay Head (Aquinnah). Although the NHPA does not require it, we urge BOEM to ensure that it has fully consulted with both relevant federal and state recognized tribes.	
BOEM-2022-0071-0249-0019	BOEM's Technical Reports include an assessment of adverse effects. The Newport Parties and Block Island Parties object to BOEM and Sunrise Wind's decision to discount the adverse effects of Sunrise Wind to Newport's and Block Island's historic character, setting, and integrity because their physical, architectural integrity will remain intact. This conclusion misses the point: The size and scale of Sunrise Wind within our clients' historic viewsheds with its constant daytime view alteration, coupled with nighttime and construction lighting, will inexorably change the historic nature of Block Island's and Newport's historic properties, their feeling, their association, and the connections of these historic properties to the ocean and its unimpeded horizon, all of which were purpose built to appreciate the view.	Thank you for your comment, this was considered in the analysis. Please see Section 3.15.5.1.2.
BOEM-2022-0071-0249-0022	As BOEM has recognized, Newport is one of the most spectacular assemblages of American architecture from its beginning to our own time. There are structures in this district that could never be built again in such close proximity, nor possessing such variety, nor by a group of such distinguished architectural firms. This district begins with several commercial blocks including the Casino, continues with the Gothic Revival villas, and includes the "Stick Style" and Shingle Style and culminates in the great 19th century summer palaces of	Thank you for your comment.

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	Bellevue Avenue and Ochre Point. The list of architects embraces almost every major designer of that time and what emerges at Newport is also a study of the development of the taste and skill of men like Richard Upjohn, Richard Morris Hunt and McKim, Mead and White over their professional careers. Yet Newport is inseparable from the ocean and its uninterrupted views. Known to many as "The City-By-The-Sea," Newport's beauty and connections to the sea have inspired not only writers and other artists, but also property owners whose families have treasured their houses and history for hundreds of years, as well as those who preserve sporting traditions such as coaching along Ocean Drive, historic beach clubs, historic golf with ocean views, social institutions like the Clambake Club, and world class ocean sailing—all part of Newport's look, feel, and association that gives it a unique sense of place that places a premium on historic preservation.	
BOEM-2022-0071-0249-0023	More rural in nature than Newport, Block Island is commonly described as a place of landscapes of sandy beaches, oceanfront bluffs, historic harbors, historic lighthouses and inns, historic oceanfront houses, and "spectacular panoramas." It is famous around the world for the Southeast Lighthouse NHL, one of the most sophisticated lighthouses in the nation of the nineteenth century, which sits on the Mohegan Bluffs overlooking the Atlantic Ocean. In 1991, The Nature Conservancy named Block Island one of " Last Great Places in the Western Hemisphere" because of its	Thank you for your comment.

Comment No.	Comment	Response
	unique connection to conservation. Writing for THE NEW YORK TIMES, journalist Paul Schneider compares Block Island to the Vineyard and Nantucket, proclaiming it "the crown jewel of the bunch." And Paul G. Allen paints this picture, which generations of families and visitors have cherished and continue to prize: "There may be no better place to salute the summer on the Eastern Seaboard than at sunset happy hour on the front lawn of the majestic 130-year-old Atlantic Inn. Adirondack chairs and rockers fan out along a hill . . . as the sky turns hues of orange, purple and red."	
BOEM-2022-0071-0249-0033	With respect to the MOA's various planning proposals, Sunrise Wind fails to appreciate that the Newport Parties and Block Island Parties are at the forefront of climate change and already understand the type of work that needs to be undertaken to help protect historic properties in the future. But Sunrise Wind knows this because our clients have explained the types of direct mitigation activities that they would consider as meaningful and ways a historic preservation mitigation fund could be deployed. All earlier comments to BOEM related to South Fork Wind and Revolution Wind are therefore incorporated herein by reference.	Thank you for your comment.
BOEM-2022-0071-0249-0040	BOEM provides no way for the public to access the following documents and requires passwords for consulting parties to view them: • Cumulative Historic Resources Visual Effects Analysis – Sunrise Wind Farm Project • Appendix A: Figures	BOEM has made information about the Project public, as appropriate. In the Notice of Intent (NOI) for the Project, BOEM identified its intent to inform its Section 106 consultation by seeking public comment and input regarding the identification of historic properties and potential effects on historic properties from activities

Comment No.	Comment	Response
	• Appendix B: Methodology for Cumulative Visual Simulations • Appendix C: Cumulative Visual Simulations • Appendix D: Key Personnel Resumes	associated with the approval of the COP. The NEPA scoping, hearings, and review have specifically included the presentation of the NHPA Section 106 process and information. The NEPA process and document postings are also used to provide public involvement, input, and review opportunities in accordance with NHPA Section 106 regulations (36 *CFR* 800.2 (d)(3)).

O.6.9. Decommissioning

Table O-18. Responses to Comments on Decommissioning

Comment No.	Comment	Response
BOEM-2022-0071-0232-0011	The DEIS claims to evaluate the impact of decommissioning, and yet none of the studies do this. Please provide a full examination of the carbon emissions for decommissioning, the cost, and the environmental impacts. As stated in 30 CFR 585, decommissioning is a requirement. BOEM cannot approve a project, state that it insists on decommissioning, and then not include this in the DEIS. Because decommissioning might harm the environment and will cost an extraordinary amount of money, it is crucial to include the specifics in the DEIS. Given that the impact assessments depend on decommissioning, unless BOEM understands the environmental impact and is certain that decommissioning will take place from both a financial and environmental standpoint, it cannot legally approve a project based on this DEIS.	Emissions from decommissioning were not quantified. Sunrise Wind will apply for a separate OCS Air Permit for decommissioning activities. Over the next 25 to 35 years, equipment, marine vessels, and technology will likely change substantially, and future vessels and equipment will have lower emissions than current vessels and equipment.
BOEM-2022-0071-0248-0019	Given the level of disruption OSW development will cause to the local environment and the existing industries that rely on it, comprehensive mitigation strategies are essential. Collaborative layout planning, while critical to reducing some impacts, cannot fully mitigate all avoidable conflicts. Full-scale mitigation must be required as part of this process. This would include environmental mitigation, particularly full decommissioning (not conceptual, as BOEM refers to decommissioning) where the environment is restored to	Mitigation and monitoring is outlined in Appendix H and has been developed based on consultation with the cooperating agencies. Mitigation and monitoring suggestions from Draft EIS comments were also considered. Before decommissioning takes place, Sunrise Wind will submit a decommissioning application for technical and environmental review.

Comment No.	Comment	Response
	its original state at the end of the lease period including removal of all cables, gravity bases, turbine components, and protection methods.	
BOEM-2022-0071-0248-0040	We are encouraged that a bond is to be held by the U.S. government to cover the costs of decommissioning. BOEM should disclose the bond amount to the public along with the estimated costs of decommissioning, to allow the public to consider the sufficiency of the bond and ease or raise any concerns over responsibility for uncovered expenses. Additional information on how the turbines will be disposed of after decommissioning should be provided and analyzed in future documents including the EIS.	BOEM's regulations are designed to ensure that a lessee or grantee can efficiently decommission their offshore wind facilities on the OCS. Those regulations require the Lessee to provide financial assurance to cover decommissioning costs. BOEM requires leaseholders to prepare conceptual decommissioning plans when their project is first proposed and requires more detailed plans for evaluation at the time decommissioning is requested.
BOEM-2022-0071-0248-0041	It also should be made clear to the public that decommissioning does not mean the wind energy area will be restored to its prior condition. It is possible that large amounts of materials required for OSW projects could remain in the ocean, e.g., scour protection materials and cables. This would represent the permanent conversion of soft sediment areas to those with hard structure. Qualitative conclusions of soft to hard substrate as beneficial, as this is generally believed to create habitat, fails to discuss impacts to species reliant on soft sediments. It is unclear whether this newly created, harder habitat will give other species a competitive advantage over species that prefer, or require soft bottom for their life cycle. The primary concern regarding cables remaining in the water is the dynamic nature of the seabed – scour protection is required	At the end of the Project's operational life, it will be decommissioned in accordance with a detailed Project decommissioning plan that will be developed in compliance with applicable laws, regulations, and best management practices (BMPs) at that time. It is expected that as part of decommissioning, Sunrise Wind shall survey and use its best efforts to remove the installed cable protection measures that are within two feet of the seabed surface. However, if, at the time of decommissioning, after gathering input from the appropriate regulatory agency(is), it may be agreed that it is in the best interest of the federal and state agencies to allow any such equipment to remain. For instance, there may be potential environmental and fisheries impacts associated with the removal of cable protection. The current assumption is that the SWEC will either be fully or partially removed from the seabed or

Comment No.	Comment	Response
	because sediment moves and therefore cables can become uncovered. It is unclear who is responsible for uncovered cables left in the ocean after decommissioning. These cables are a major safety concern for fishing vessels operating mobile bottom tending gear as they can hang-up on cables.	decommissioned in situ. This information was added to Section 2.1.2.3.2 of the Final EIS. Within Section 3.7, *Benthic Resources*, it is assumed that cables would be removed during decommissioning, which would have a greater impact on benthic resources.
BOEM-2022-0071-0248-0038	BOEM has yet to include a clear decommissioning plan in any of their DEISs to date. While it is BOEM's mandate to remove all foundations from 15 feet below the mudline, there is no clear designation of how harm will be quantified and what analyses will be conducted. We strongly encourage BOEM to not be over reliant on "conceptual" decommissioning and require developers to include a full decommissioning plan.	Decommissioning is described in Section 2.1.2.3. Before decommissioning takes place, Sunrise Wind will submit a decommissioning application for technical and environmental review.
BOEM-2022-0071-0248-0039	Impact analyses for O&M are based upon a 35-year operational term. Yet, it is anticipated that some projects may last longer. If it is anticipated that installation will remain longer, or even permanent, analyses in the EIS must reflect these longer time periods. This is noteworthy for other ocean users, such as the fishing industry, who may be anticipating the re-opening of certain areas to fishing for future generations.	Based on the COP, the SRWF is planned to be operational for at least 25 years, unless the lease is extended. Impacts are analyzed for 35 years to account for a lease extension if it were to occur.

O.6.10. Demographics, Employment, and Economics

Table O-19. Responses to Comments on Demographics, Employment, and Economics

Comment No.	Comment	Response
BOEM-2022-0071-0195-0004	A project labor agreement (PLA) ensures the timely completion of an offshore wind development and ensures good union construction jobs, thus, conforms with BOEM's statutory obligations. BOEM is obligated to obtain a fair return on its leases of offshore sites. 43 U.S.C. § 1337(p)(2)(A). Its leases for the development of offshore wind facilities include provisions for ongoing payments to the federal government from proceeds on electricity generated by those facilities. See, e.g., 35 C.F.R. § 585.06. PLAs ensure on-time, quality completion of projects without disruption and, thus, ensure that the government will receive its fees on a timely basis. Building the SRWF under a PLA serves as a beneficial impact to environmental justice communities by ensuring the beneficial health and economic effects of offshore wind inure to the benefits of those communities. In general, Black and Latinx workers who are union members are paid 29 percent and 37 percent more than those not covered by a collective bargaining agreement. A PLA ensures that all workers performing a specific trade or craft receive the same level of pay and benefits regardless of race, religion, or gender.	Analysis of planned activities such as port improvements, renovations and remediation, along with associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0006	We urge BOEM to require SRWF to include in its DEIS • What steps SRWF is taking to build new facilities associated with the operations, maintenance or	Analysis of planned activities such as port improvements, renovations and remediation, along with associated job creation are described in Section 3.16 and

Comment No.	Comment	Response
	supply chain for SRWF under a Project Labor Agreement	Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0007	We urge BOEM to require SRWF to include in its DEIS • What steps SRWF is taking to ensure the renovation of any facilities associated with the construction, operations, maintenance or supply chain will be done under a Project Labor Agreement	Analysis of planned activities such as port improvements, renovations and remediation, along with associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0008	We urge BOEM to require SRWF to include in its DEIS • What steps SRWF is taking to ensure the remediation of hazards or hazardous materials from land or buildings associated with the SRWF be done under a project labor agreement at the established prevailing or industry standard wages and benefits and with adequate protections for worker and community safety	Analysis of planned activities such as port improvements, renovations and remediation, along with associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0009	Sunrise Wind has not declared any commitments in the DEIS about the quality of jobs in O&M activities; the creation of family-sustaining jobs where workers have a free voice in their working conditions is crucial to mitigating the employment and economic impacts of SRWF. Moreover, the existence of a labor dispute could	As noted within the COP (Table ES-1 and Section 4.7.1.2) as well as within the Final EIS (Section 3.16.5.5 and Appendix H under Table H-1 APM No. SOC-01), local workers will be hired when feasible to meet labor needs during the three phases of the Project - construction, O&M and decommissioning. Overall, the Project would

Comment No.	Comment	Response
	interrupt the project's operation, putting BOEM's revenue at risk–and risking noncompliance with the statutory mandate of a fair return–and causing economic harm to the communities affected by the project. The transition to renewable energy sources can take advantage of the infrastructure and workforce created by older and fossil fuel-based technologies in New York. Storage areas, substations and power plants can be adapted and repurposed to support renewable energy production, storage and transmission	have economic benefits to many of the port areas that would support the phases of the Project, where, even if local workers were not hired directly by the developer, indirect and induced jobs will be created in the community.
BOEM-2022-0071-0195-0010	CJNY urges BOEM to require SRWF to include more detail in its DEIS to minimize the adverse socioeconomic effects and maximize beneficial impacts through the creation of good union careers: • What steps SRWF is taking to operate under a Labor Peace Agreement (LPA) for all Operation & Maintenance directly employed and contracted workers and including those who may work on port facilities or transmission infrastructure to connect to the grid	Analysis of planned activities such as port improvements, renovations and remediation, along with associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0011	CJNY urges BOEM to require SRWF to include more detail in its DEIS to minimize the adverse socioeconomic effects and maximize beneficial impacts through the creation of good union careers: • What steps SRWF is taking to ensure that all O&M jobs for workers directly employed as well as employed by contractors will pay at least the	Analysis of planned activities such as port improvements, renovations, and remediation, along with associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the

Comment No.	Comment	Response
	prevailing wage rate or established industry standard wages and benefits so that good jobs are being created	discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0012	CJNY urges BOEM to require SRWF to include more detail in its DEIS to minimize the adverse socioeconomic effects and maximize beneficial impacts through the creation of good union careers: • What steps SRWF is taking to ensure it has a procurement policy for use of contractors based on best value rather than low bid, in order to fairly evaluate regulatory compliance history and fair employment practices	Analysis of planned activities such as port improvements, renovations, and remediation, along with associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0013	CJNY encourages BOEM to assess the impacts of the Proposed Action on the workers who will be manufacturing the parts and supplies for the SRWF and integrate such assessments in the final environmental impact statement (FEIS). Again, any interruption in the supply chain for SRWF delays this crucial investment in reducing greenhouse gas emissions, and puts the economic well-being of affected communities at risk. BOEM can provide leadership to accelerate domestic manufacturing to support the growing offshore and onshore wind industries by incentivizing offshore wind developers to invest in domestic manufacturers and domestic manufacturing to produce the materials needed. This has the beneficial environmental impact of reduced transit times and costs, creates many more good jobs for workers in the communities where the factories or production facilities are located and	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.

Comment No.	Comment	Response
	strengthens the tax base of the local communities. Where new manufacturing facilities are being contemplated, we urge BOEM to incentivize location of new facilities in environmental justice communities, low-income communities, or communities adversely impacted by the transition away from fossil fuels including communities with decommissioned nuclear power plants.	
BOEM-2022-0071-0195-0014	CJNY urges BOEM to require SRWF to provide more detail regarding their supply chain including: What measures SRWF will take to incentivize use of domestic manufacturing and domestic manufacturers	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0015	CJNY urges BOEM to require SRWF to provide more detail regarding their supply chain including: What measures SRWF will take to encourage labor peace agreements for its Tier 1 supply chain manufacturers	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the

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		Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0016	CJNY urges BOEM to require SRWF to provide more detail regarding their supply chain including: What measures SRWF will take to encourage Tier 2 employers to adopt labor peace agreements	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0017	CJNY urges BOEM to require SRWF to provide more detail regarding their supply chain including: What measures SRWF will take to encourage supply chain employers to pay family sustaining wages and benefits at or above the levels that may have been established through collectively bargained agreements	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0018	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures will SRWF take to require that the employers pay full cost of GWO training, the	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and

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	required annual anti-harassment training in New York State or any specialized training needed by workers engaged in the constructions, operations and maintenance of the project	retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0019	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures will SRWF take to engage with its employers and union stakeholders meet to develop mutually agreeable plans to provide job opportunities for workers from environmental justice communities and workers displaced by the transition away from fossil fuels in the construction, operations and maintenance of the project	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0020	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures will SRWF take to make sure the jobs created are accessible by public transportation or by a SRWF shuttle or transit program so that there is not an unreasonable long commute time to the work location in order to make the jobs more accessible to workers who may not own or have access to cars	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0021	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources

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	to address the following areas: • What measures will SRWF take to make sure employers are living up to their commitments with regard to fair employment practices	allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0022	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures SRWF will take to make publicly available fair employment policies such as requirement for Project Labor Agreements, Labor Peace Agreements, Best Value Contracting, and the adoption of prevailing wages	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0023	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures will SRWF take to maintain harmonious labor relations and provide information to the union stakeholders relating to the employment and working conditions of workers for the project	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not

Comment No.	Comment	Response
		known.
BOEM-2022-0071-0195-0024	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures will SRWF take to ensure high levels of workplace safety including a detailed written safety program for employees and subcontractors	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0025	There is additional information that is common across employment sectors. CJNY urges BOEM to require SRWF to address the following areas: • What measures will SRWF take to require contractors and subcontractors to certify that workers are properly classified	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0195-0026	CJNY supports the development of the SRWF and urges BOEM to require SRWF provide more detailed and comprehensive information and to take the necessary steps to maximize the positive environmental justice, demographic, employment, and economic impacts. We appreciate the opportunity to share comments on behalf of working New Yorkers to realize a responsibly	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and

Comment No.	Comment	Response
	and equitably developed offshore wind industry. We welcome the opportunity to further discuss our recommended mitigation measures. If you have any questions or wish to discuss our recommendations, I can be reached at lfriedlaender@climatejobsny.org.	would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0205-0001	The DEIS provides information related to job creation, including direct, indirect, and induced jobs. The FEIS should build on this information and include further specificity for each of these categories. The DOL's Good Jobs Initiative highlights equity and job quality requirements in their grant making process that should be strongly considered by BOEM for use in the FEIS. The equity and job quality requirements include proactively addressing racial equity; reducing barriers to opportunity; supporting the creation of good paying jobs with the free and fair choice to join a union; providing opportunities for all workers, including workers underrepresented to be trained in placed in good-paying jobs directly related to the project; utilization of Project Labor Agreements and/or Local Hire provisions, training and placement programs for underrepresented workers; and adopting an equity and inclusion program/plan focused on procurement, material sourcing, construction, inspection and hiring. These are great examples of metrics related to equity and job quality and should be considered for evaluating the job creation benefits associated with this Project.	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0205-0002	The DEIS provides some information related to the local, regional, and domestic manufacture of components to be utilized in the project, but BOEM should make efforts	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with

Comment No.	Comment	Response
	to include greater detail in the FEIS.	partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0205-0003	The FEIS should specify job categories and job numbers per category resulting from each domestically manufactured component, as well as how these numbers are accounted for in the total number of direct, indirect, and induced jobs, gross state product, and personal income anticipated from the project.	BOEM does not have economic impact data on a component-by-component basis.
BOEM-2022-0071-0205-0004	The FEIS should also include an assessment of education and certifications necessary to access each job category, the training, average wages, hours, career advancement, physical demands and safety information, as well as any commitments the company has made to ensure workers have the free and fair choice to join a union, such as through a union neutrality agreement.	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known. The specific education and certifications necessary for each job category for hiring are not yet known; however, the National Renewable Energy Laboratory (NREL) published a paper entitled *U.S. Offshore Wind Workforce Assessment*, which outlines the types of jobs and general requirements that could be

Comment No.	Comment	Response
		expected, including Section 3.2, *Education and Training* that breaks down a variety of programs being utilized to fill this expected workforce.
BOEM-2022-0071-0205-0005	Additional information regarding material quality, standards and certifications should also be included along with other information germane to securing a supplier contract with the offshore wind developer.	The developer would adhere to all material quality, standards and certifications required by the industry; however, these would be outlined and specified separately as part of supplier sourcing and contracting and is not required for this section.
BOEM-2022-0071-0205-0006	the FEIS should also contain information about the manufacture of offshore wind energy components that did not take place in the U.S., in order to understand the full breadth of employment benefits that could be expected as a domestic offshore wind supply chain matures.	The economic analysis does not include impacts that occur outside of the United States due to the scope of the EIS and because the available economic impact tools do not allow for these calculations.
BOEM-2022-0071-0205-0007	Similarly, for O&M (Operations and Maintenance) job impacts, the FEIS should specify O&M job categories, job numbers in each category, and how job numbers are accounted for in the total number of direct, indirect, and induced jobs, gross state product, and personal income anticipated from the project.	Final EIS Section 3.16.5 outlines the number of direct jobs that would be generated during construction and operation phases of the Project (this information is also included in COP, Appendix W, *Economic Modeling Report*). In addition, the range of positions anticipated are outlined within the section, and include engineers, environmental scientists, financial analysts, trade workers, and other related jobs. The precise mix of job categories and associated personal income anticipated would be negotiated with Sunrise Wind on an individual basis and is unknown at this time.
BOEM-2022-0071-0205-0008	The FEIS should also include an assessment of education and certifications necessary to access those jobs, training, average wages, career advancement, hours, physical demands, and safety information, as well as any	Section 3.16.5 details the commitments Sunrise Wind has made regarding hiring, resources allocated to seed funding, and working with partners to develop capabilities and experience in the domestic offshore

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	commitments the company has made to ensure workers have the free and fair choice to join a union, such as through a union neutrality agreement.	wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are unknown. The specific education and certifications necessary for each job category for hiring are not yet known; however, the NREL published a paper entitled *U.S. Offshore Wind Workforce Assessment*, which outlines the types of jobs and general requirements that could be expected, including Section 3.2, *Education and Training*, that breaks down a variety of programs being utilized to fill this expected workforce.
BOEM-2022-0071-0205-0009	The FEIS should also indicate the number of jobs, if any, require specialized experience that would prohibit workers in the U.S. from accessing those jobs, and the specific experience and training that is required.	Section 3.16.5 details the commitments Sunrise Wind has made regarding hiring, resources allocated to seed funding, and working with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are unknown. The specific education and certifications necessary for each job category for hiring are not yet known; however, the NREL published a paper entitled *U.S. Offshore Wind Workforce Assessment*, which outlines the types of jobs and general requirements that could be expected, including Section 3.2, *Education and Training*, that

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		breaks down a variety of programs being utilized to fill this expected workforce.
BOEM-2022-0071-0205-0010	When it comes to training, the FEIS should specify whether workers will need to go overseas to receive training, and the duration of that training. Given the size of offshore wind projects, the FEIS should be sure to specify jobs categories related to the operation and maintenance of every aspect of the Project, including the turbines themselves, cables, and onshore and offshore substations.	As noted in Final EIS Section 3.16.5, Sunrise Wind is providing $10 million in seed funding to create a National Offshore Wind Training Center in Suffolk County. Together with partners from labor, academia, and the environmental community, the National Offshore Wind Training Center would feature specialized facilities and programming that is essential to offshore work, aiming to cement Suffolk County's role as an integral part of the emerging offshore wind industry. Suffolk County Community College would serve as the academic arm of this initiative. Finally, Sunrise Wind has also committed to performing secondary steel fabrication in the New York Capital Region and funding the Upper Hudson Valley Work Force Initiative. These initiatives would ensure residents throughout New York have access to this opportunity and the training needed to succeed in the offshore wind industry.
BOEM-2022-0071-0205-0011	Any apprenticeship utilization should also be documented, and the types of apprenticeships to ensure that they are DOL-certified.	Section 3.16.5 details the commitments Sunrise Wind has made regarding hiring, resources allocated to seed funding, and working with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are unknown. The specific education and certifications necessary for each

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		job category for hiring are not yet known; however, the NREL published a paper entitled *U.S. Offshore Wind Workforce Assessment*, which outlines the types of jobs and general requirements that could be expected, including Section 3.2, *Education and Training*, that breaks down a variety of programs being utilized to fill this expected workforce.
BOEM-2022-0071-0205-0012	The DEIS provides information related to job creation in the construction of the Project. The FEIS should include all construction jobs associated with the project, including any construction jobs anticipated to prepare the port that is selected for assembly, preparation of the cable route and interconnection, and the construction or site preparation of any manufacturing facilities.	Final EIS Section 3.16.5 outlines the number of direct jobs that would be generated during construction and operation phases of the Project (also included in COP Appendix W, *Economic Modeling Report*). In addition, the same section also outlines the total number of jobs estimated during construction and operational phases when also including indirect and induced jobs.
BOEM-2022-0071-0205-0013	BOEM should specify job categories, job numbers in each category, and how job numbers are accounted for in the total number of direct, indirect, and induced jobs, gross state product, and personal income anticipated from the project. (as they relate to construction)	Final EIS Section 3.16.5 outlines the number of direct jobs that would be generated during construction and operation phases of the Project (also included in COP Appendix W, *Economic Modeling Report*). In addition, the range of positions anticipated are outlined within the section, and include engineers, environmental scientists, financial analysts, trade workers, and other related jobs. The precise mix of job categories and associated personal income anticipated would be negotiated with Sunrise Wind on an individual basis and is unknown at this time.
BOEM-2022-0071-0205-0014	The FEIS should also include an assessment of education and certifications necessary to access each job category, the training, average wages, hours, career advancement, physical demands and safety information.	Final EIS Section 3.16.5 outlines the number of direct jobs that would be generated during construction and operation phases of the Project (also included in COP Appendix W, *Economic Modeling Report*). In addition, the range of positions anticipated are outlined within

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		the section, and include engineers, environmental scientists, financial analysts, trade workers, and other related jobs. The precise mix of job categories and associated personal income anticipated would be negotiated with Sunrise Wind on an individual basis and is unknown at this time.
BOEM-2022-0071-0205-0015	If any construction jobs require specialized experience that prohibit workers in the U.S. from accessing these jobs, that should also be detailed, including the number of jobs, as well as the training and experience required.	Final EIS Section 3.16.5 outlines the number of direct jobs that would be generated during construction and operation phases of the Project (also included in COP Appendix W, *Economic Modeling Report*). In addition, the range of positions anticipated are outlined within the section, and include engineers, environmental scientists, financial analysts, trade workers, and other related jobs. The precise mix of job categories and associated personal income anticipated would be negotiated with Sunrise Wind on an individual basis and is unknown at this time.
BOEM-2022-0071-0205-0016	The FEIS should also specify whether workers will need to go overseas to receive training, and the duration of that training.	Final EIS Section 3.16.5 outlines the number of direct jobs that would be generated during construction and operation phases of the Project (also included in COP Appendix W, *Economic Modeling Report*). In addition, the range of positions anticipated are outlined within the section, and include engineers, environmental scientists, financial analysts, trade workers, and other related jobs. The precise mix of job categories and associated personal income anticipated would be negotiated with Sunrise Wind on an individual basis and is unknown at this time.
BOEM-2022-0071-0205-0017	The FEIS should be sure to include the status of Project Labor Agreements (PLAs) or Community Workforce	Analysis of planned activities such as port improvements, renovations and remediation, along with

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	Agreements (CWAs) associated with all aspects of the construction of the project. A PLA is an instrument to predict and control project timelines and labor costs. A PLA establishes the terms and conditions of employment of workers on specific construction projects, including wages, hours, working conditions, and dispute resolution methods. These agreements can be utilized at the state and local level to ensure high-road labor standards and timely project completion. PLAs promote safe, quality, cost-effective project delivery by providing project owners with unique access to the safest, most productive, best-trained skilled craft labor available in any given market. They can also help to ensure equitable access to jobs by including diversity, equity, and inclusion and local hire provisions. When it comes to equity, CWAs can be even more expansive and are negotiated with both unions and community partners. According to the AFL-CIO, CWAs "go well beyond the traditional experience and use of PLAs to explicitly address the legitimate needs and interests of urban communities that have historically been excluded from the benefits of economic development." CWAs frequently include local hire provisions, targeted hire of low-income or disadvantaged workers, and the creation of pre-apprenticeship pathways for careers on the project.	associated job creation are described in Section 3.16 and Appendix E. Information on salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0205-0018	Apprenticeship utilization should also be documented, and the types of apprenticeships to ensure that they are union programs or DOL-certified, as well as the ratio of apprentice to journeymen on the various job sites.	Section 3.16.5 details the commitments Sunrise Wind has made regarding hiring, resources allocated to seed funding, and working with partners to develop capabilities and experience in the domestic offshore

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		wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are unknown. The specific education and certifications necessary for each job category for hiring are not yet known; however, the NREL published a paper entitled *U.S. Offshore Wind Workforce Assessment*, which outlines the types of jobs and general requirements that could be expected, including Section 3.2, *Education and Training* that breaks down a variety of programs being utilized to fill this expected workforce.
BOEM-2022-0071-0205-0019	BOEM should be sure to include detailed information regarding training. One of the main mechanisms for building career pathways is through registered apprenticeship, preapprenticeship, and other union-affiliated training programs. Pre-apprenticeship programs aim to ensure that workers can qualify for entry into an apprenticeship program and have the skills and support they need to succeed. These programs are generally designed to target certain populations or demographics such as low-income workers, workers of color, women, and other marginalized communities. Additionally, many unions offer training throughout a member's career to enable them to stay up to date with changes in technology. The most successful preapprenticeship programs are those affiliated with registered apprenticeships or other contractually agreed	As noted in Final EIS Section 3.16.5, Sunrise Wind is providing $10 million in seed funding to create a National Offshore Wind Training Center in Suffolk County. Together with partners from labor, academia, and the environmental community, the National Offshore Wind Training Center would feature specialized facilities and programming that is essential to offshore work, aiming to cement Suffolk County's role as an integral part of the emerging offshore wind industry. Suffolk County Community College would serve as the academic arm of this initiative. Finally, Sunrise Wind has also committed to performing secondary steel fabrication in the New York Capital Region and funding the Upper Hudson Valley Work Force Initiative. These initiatives would ensure residents throughout New York have access to this opportunity and the training needed

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	on-the-job training programs. Apprenticeships are registered through a state apprenticeship agency or through the Federal Department of Labor. Registered apprenticeships are paid positions that combine on-the-job training with classroom instruction in a trade. Construction unions operate robust registered apprenticeship programs while industrial unions work with employers on joint labor management training programs that also provide a combination of classroom and on-the job skills training. When these programs are paired with recruitment strategies such as partnering with a community group to provide information about workforce and training opportunities and providing wrap around services, the benefits can be even greater. Many examples of programs providing such services can be found in a recent White House Fact Sheet.	to succeed in the offshore wind industry.
BOEM-2022-0071-0205-0020	BOEM should also include any language access needs for the local community that may be present in order to access jobs benefits. The NEPA guidance study does not require demographics related to language or education, but BOEM should consider these and other qualities that should be taken into account to ensure jobs are accessible to a diverse workforce. Any agreements that project developers have made to increase access, be it to jobs in manufacturing, operations and maintenance, construction, or otherwise, should be detailed in the FEIS to increase transparency and the local community's ability to access these resources and benefits.	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. In addition, local workers will be hired where possible.

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BOEM-2022-0071-0205-0021	BOEM should include information related to employment benefits. For example, fringe benefits are allowances and services provided by employers to their employees as compensation in addition to regular salaries and wages. Fringe benefits include, but are not limited to, the cost of leave (vacation, family-related, sick or military), employee insurance, pensions, and unemployment benefits. The cost of fringe benefits in the form of employer contributions or social security, employee life, health, unemployment, and workers compensation insurance. Healthcare coverage and retirement contributions are typically included as fringe benefits, or covered in collective bargaining agreements, or other labor agreements. In the event however, that a worker is not covered by a labor agreement and an employer does not include healthcare coverage and retirement contribution as fringe benefits, the employee does not have access to employer provided health insurance or retirement contributions. In the FEIS, BOEM should include all available information related to employment benefits related to covered jobs impacts.	Section 3.16.5 provides details on the commitments Sunrise Wind has made with respect to hiring, resources allocated to seed funding, and working together with partners to develop capabilities and experience in the domestic offshore wind industry. Information on fringe benefits, salaries, training pathways, recruitment, and retention plans would vary across the supply chain and would not be under the direct control of Sunrise Wind. Hiring targets that may be included in contracts for the Project are at the discretion of Sunrise Wind and are not known.
BOEM-2022-0071-0232-0019	The executive order mandates offshore developments should stimulate economic development. Sunrise Wind, a NY development will provide a minimum of stable jobs, none of which are promised to RI. Moreover, RI hosts 21 million tourists every year. Tourism provides 11% of RI's jobs and supplies the state with 1.3 billion dollars of tax revenue (RICC, 2020). Sunrise Wind turbines will dominate the horizon from nearly every public beach in RI and will be visible from a distance of	The impact of the Proposed Action on recreation and tourism is presented in Final EIS Section 3.21. Additionally, the impact of the Proposed Action on scenic and visual resources is presented in Final EIS Section 3.22. To the extent that impacts to these two resources would impact the economy of other states has been incorporated into Section 3.16, *Demographics, Employment and Economics*.

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	40 miles. The visual impact will affect over 600 popular destinations, including 178 public beaches in MA and RI. Contrary to the government's hopeful projections, a survey in England indicates that 37% of tourism-related business owners affirm that wind farms have negatively impacted their businesses (Mordue, 2020). The BOEM DEIS minimizes the impact on tourism and does not consider the effect this will have on RI's economy.	
BOEM-2022-0071-0242-0016	We urge BOEM to expand its analysis of offshore wind's beneficial climate impacts. The DEIS details many of the pressing impacts that climate change presents to communities, people, wildlife, and natural resources,18 as well as the benefits offshore wind brings from carbon and other pollutant emissions reductions. However, the DEIS does not account for the climate benefits of displacing full life-cycle emissions of gas generation, which includes the release of the highly potent global warming potential of methane emissions (84 times that of CO2 on a 20-year time frame) emitted during the extraction and in the transmission and compression of gas. The DEIS also does not monetize these climate benefits using the social cost of carbon to illustrate differences between the social benefits of the Project and the relative social cost of the alternatives. We recommend integrating the social and environmental costs of greenhouse gas emissions into the evaluation of project impacts and impacts of alternatives. Recent interim guidance issued by the CEQ recommends that agencies "provide additional context	Thank you for your comment. Per Council on Environmental Quality (CEQ)'s interim guidance titled "National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change" released on January 9, 2023 (found in *Federal Register* Vol. 88, No. 5, Page 1,196), the guidance introduces the "rule of reason" (page 1,202). Offshore wind development is the development of renewable energy solutions and is overall providing a social benefit to help slow climate change impacts. Per the rule of reason, "absent exceptional circumstances, the relatively minor and short-term GHG emissions associated with the construction of certain renewable energy projects, such as utility-scale solar and offshore wind, should not warrant a detailed analysis of lifetime GHG emissions." GHG emissions are discussed in the EIS in Section 3.4, *Air Quality*.

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	for GHG [greenhouse gas] emissions, including through the use of the best available social cost of GHG (SC-GHG) estimates, to translate climate impacts into the more accessible metric of dollars, allow decision makers and the public to make comparisons, help evaluate the significance of an action's climate change effects, and better understand the tradeoffs associated with an action and its alternatives." The Interagency Working Group on Social Cost of Carbon has produced estimates for the social cost of carbon in order to "allow agencies to understand the social benefits of reducing [greenhouse gas] emissions, or the social costs of increasing suchemissions, in the policy making process." The working group presents values for social costs from 2020-2050, assuming discount rates of 5 percent, 3 percent, 2.5 percent and the 95th percentile of the 3 percent discount rate. These values range from $14 to $260 (in 2020 dollars per metric ton of CO2) and could be used to monetize the costs imposed by the net greenhouse gas emissions associated with failing to procure the approximately 33 GW of offshore wind contemplated by this DEIS. We urge BOEM to pursue measures to ensure that any negative impacts to environmental justice communities are mitigated and that the many environmental and economic benefits offshore wind can provide communities are maximized. One way to do this is to ensure that project construction occurs in a manner that does not create a level of pollution at any port that	

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	could have deleterious impacts to that community.	
BOEM-2022-0071-0065-0019	Sunrise Wind will also help spur an offshore wind economy in New York and will bring 800 good paying jobs, plus thousands of indirect jobs, to our region. CCE is thrilled that the $10 million National Wind Offshore Training Institute located at Suffolk County Community College in Brentwood has broken ground and will soon be educating and training the next generation in sustainable green jobs. For residents in Brentwood and several other surrounding Disadvantaged Communities, this institute along with offshore wind training programs at Farmingdale College and Stony Brook University will provide substantial jobs and economic benefits in the areas of Suffolk County that need it most.	Thank you for your comment. Economic benefits are included in Section 3.16.5.
BOEM-2022-0071-0065-0020	Sunrise Wind will also be serviced by an Operations and Maintenance Hub in East Setauket which will create 100 local jobs, while Port Jefferson harbor will be the home port of the first-ever American-flagged, Jones Act-qualified Service Operations Vessel. These local investments will help kick-start a just transition from fossil fuels to renewable energy, create both direct and indirect jobs, and provide investments in frontline and environmental justice communities. CCE thanks BOEM for their detailed breakdown of the economic and jobs benefits of these projects in the COB and DEIS	Thank you for your comment. Economic benefits are included in Section 3.16.5.
BOEM-2022-0071-0195-0001	CJNY's position is that offshore wind energy is an urgent and essential investment necessary for the transition to a clean and renewable energy economy. Equally urgent is the need to ensure that the new renewable energy economy supports high road employment practices with	Requested work/labor agreements that have been established for Construction or O&M are provided and incorporated.

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	the creation of family sustaining jobs in all phases of the projects and the related industries. We support taking intentional measures to create accessible pathways to long-term careers for workers of color, people who live in environmental justice areas, workers displaced by the transition way from fossil fuels and those who have historically been left out or marginalized. Finally, because of the importance of and increasing dependence on consistent sources of renewable energy, CJNY believes that the renewable energy industry should lead on labor management partnerships, labor peace agreements, utilization of state approved training and apprentice programs with a track record of success in placing apprentices in career employment. While this project raises important environmental considerations, CJNY is focusing our comments on the project's impact on the human environment. We support development of SRWF and urge BOEM to require the Sunrise Wind Farm to include a more detailed and comprehensive assessment and plan regarding the economic and environmental justice impacts of the project so it is developed as equitably and responsibly as possible.	
BOEM-2022-0071-0195-0005	In New York, the Building Trades Unions have partnered with pre-apprentice programs with a demonstrated ability to bring workers of color, women, justice involved individuals, veterans into successful careers in the workforce. This has led to good jobs for thousands of workers of color, veterans and women, and the union construction workforce is getting more representative every year. People of	Thank you for your comment.

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	color accounted for 61.8 percent of all New York City residents' union apprenticeships in 2014, far higher than the 36.3 percent share in 1994. Black apprentice participation roughly doubled, rising from 18.3 percent in 1994 to 35.1 percent in 2014. This growing representation has a significant economic impact. A 2017 study found that the "union wage advantage (the percent by which union wages exceed nonunion wages) is larger for construction workers (42.2 percent) than other blue-collar workers, and, among racial and ethnic groups, largest for black (36.1 percent) and Hispanic (52.7 percent) construction workers." There are cascading beneficial economic and social impacts when workers are paid family-sustaining wages with health and retirement benefits in the communities where the workers live because the workers will spend money in their local communities. There is some additional information that SRWF did not include in its DEIS that we believe would be useful in a more comprehensive understanding of the economic impact of the project and could lead to more intentional measures to create good jobs at the established industry standards.	

O.6.11. Environmental Justice

Table O-20. Responses to Comments on Environmental Justice

Comment No.	Comment	Response
BOEM-2022-0071-0195-0002	Offshore wind energy is critical to address the climate crisis and can lead to a more just society if done with equity as a core principle. New York State and federal offshore wind energy goals, along with climate science targets, demand that the nascent offshore wind industry in the United States develop quickly. It is imperative in this historical moment that we reach those goals responsibly and equitably by creating beneficial impacts through family-sustaining union careers in every phase of the project including the supply chain. The Congressional policy spelled out in Outer Continental Shelf Lands Act provides that "the outer Continental Shelf is a vital national resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs." 43 USC § 1332(3). Congress intended the term "environmental safeguards" to encompass not just the preservation of natural resources, but also the promotion of social and economic conditions of persons whose lives are or may be affected by development projects. Thus, the "environmental impact" studies required by the Act must include analyses of "the environmental impacts on the human, marine, and coastal environments of the outer Continental Shelf." 1346(a)(1) (emphasis added).	As noted within the COP (Table ES-1 and Section 4.7.1.2) as well as within the Final EIS (Section 3.16.5.5 and Appendix H under Table H-1, APM No. SOC-01), local workers will be hired when feasible to meet labor needs during the three phases of the Project - construction, O&M and decommissioning. Overall, the Project would have economic benefits to many of the port areas that would support the phases of the Project, where, even if local workers were not hired directly by the developer, indirect and induced jobs will be created in the community.

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	See also 43 U./S.C. § 1332(4) (Congress emphasized the "national interest in the effective management of the marine coastal, and human environments." 43 USC § 1332(4) (emphasis added). Thus, consistent with the Act, BOEM must require bidders for offshore leases to detail how their plans will promote and preserve the welfare of the communities affected by the project for which the lease is sought. These communities include the persons who will work on the project, who will maintain the project, who will produce the materials to be used in the project and the communities proximate to the development, the ports and infrastructure that will support the project. The term "human environment" has a particular meaning. Moreover, Congress defined the term to mean "[t]he physical, social, and economic components, conditions, and factors which interactively determine the state, condition, and quality of living conditions, employment, and health of those affected, directly or indirectly, by activities occurring on the outer Continental Shelf." 43 U.S. Code § 1331(i). See also, 30 § CFR 585.112. BOEM's own regulations require prospective lessees to describe in their Site Assessment Plans, GAPs, and Construction Operations Plans information concerning the project's implications for "[e]mployment existing offshore and coastal infrastructure (including major sources of supplies, services, energy, and water), land use, . . . [and] minority and lower income groups." 30 CFR §§ 585.611(b), 585.627(7), and 585.646(7). For these	

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	reasons, we urge BOEM to require much more information from SRWF than is currently described in the DEIS. BOEM must be seeking information that will help empower affected environmental justice communities and help close the wealth gap through good union careers. We note that this is precisely what the President has demanded that agencies do with E.E. 14008, §§ 217 and 219.	
BOEM-2022-0071-0205-0023	It should also include any community consultation related to adverse impacts and methods for continued community engagement around the oversight, monitoring, and structuring of mitigation plans including adaptive management strategies.	Outreach and community consultation for the Project were conducted through the NEPA process, which included public scoping meetings and public hearings following the release of the Draft EIS. Recordings and comments from these meetings are available on BOEM Sunrise Wind website: https://www.boem.gov/renewable-energy/state-activities/sunrise-wind.
BOEM-2022-0071-0232-0018	Twenty-five percent of RI households suffered from food insecurity in 2020 (Ahlquist, 2020). Diminished fishing resources and potentially contaminated catch as secondary impacts of the project may exacerbate food insecurity problems. Many economically challenged families rely on the availability of locally sourced and affordable seafood, such as scup, squid, and a variety of shellfish. Any diminishment of fish stocks will negatively impact these families. Furthermore, Sunrise Wind, as well as the other 6 developments in the area will all impact RI more than any other New England state. These projects burden RI, the poorest of the New England States, disproportionately. Both CT and MA, much richer states per capita, and with more carbon	Food insecurity is an important issue and text has been added to Section 3.17 introducing the food insecurity issue and how environmental justice communities may be impacted. The environmental justice analysis is typically conducted at a lower geographic level to identify and focus on impacts on particular communities, not at the state level. However, the Final EIS has included two new tables within Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing* that present revenue exposure related to the Sunrise Wind Project by both port and by state. This provides additional context on potential impacts for different communities.

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	emissions, do not share the burden equally. The BOEM DEIS does not address the relative injustice to the people of RI. Again, this violates the dictum expressed in the Executive order to promote environmental justice, not to burden the most economically depressed state in the region with the entire build-out of offshore wind development.	
BOEM-2022-0071-0065-0022	Sunrise Wind has meaningful potential to create transformative community benefits, job growth, air quality improvements, and economic investments. Communities like Mastic and Shirley, low-income communities on the front lines of climate change, have been vocally supportive of Sunrise Wind and the tangible benefits that this project could bring to the area, not only in terms of economic and community benefits but also in combatting climate change. This project has real public buy-in due to Ørsted fostering the meaningful discussions, regular project updates, and community input that is essential to achieving just transition from fossil fuels to renewable energy. This support was demonstrated during BOEM's public meetings, and CCE would like to emphasize that BOEM should strongly consider the overwhelming local support for this project when moving forward with the FEIS and Record of Decision.	Thank you for your comment. The community input provided at public meetings and throughout the public comment period on the Draft EIS has been documented within the appendices of the Final EIS, including letters of support. The economic benefits of the Project are also outlined in Section 3.16, *Demographics, Employment, and Economics*.
BOEM-2022-0071-0195-0003	SRWF can become a model on how to transition responsibly and equitably to a clean energy economy. According to the DEIS, 49 percent of communities affected by the development of the SRWF are considered environmental justice communities, which	Thank you for your comment. Project Labor Agreements (PLAs) and other mechanisms to further document and ensure beneficial impacts from the various phases are being evaluated and implemented by Sunrise Wind.

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	includes communities of color as well as low income communities. CJNY applauds Sunrise Wind for signing a project labor agreement with North American Building Trades Unions to ensure beneficial impacts from the construction phase of the SRWF for environmental justice communities. However, more can be done. Beneficial impacts can be extended to the lifetime of the project, to the operation and maintenance (O&M) phase and throughout the manufacturing supply chain. CJNY supports the development of the SRWF and recommends BOEM require SRWF to provide additional information relating to the environmental justice impacts and demographic, employment, and economic impacts:	

O.6.12. Finfish, Invertebrates, and Essential Fish Habitat

Table O-21. Responses to Comments on Finfish

Comment No.	Comment	Response
BOEM-2022-0071-0065-0018	In addition to the benefits listed in the DEIS, CCE urges BOEM to consider the potential benefits of offsetting the need for the Northport and Port Jefferson power plants, which are two of the three legacy fossil fuel power plants on Long Island. During the DEIS public meetings, concerns were raised about the impact that the cooling system in the Sunrise Wind project would have on fish populations, particularly Atlantic Cod. According to the DEIS, up to 34,239 individual Atlantic cod larvae could be entrained through Sunrise Wind's cooling system, which would be the equivalent of 17 adult fish killed per year. In contrast, the Port Jefferson plant is responsible for the entrainment of over 1 billion larvae and impingement of over 75,000 fish. The Northport power plant is responsible for the entrainment of almost 8.5 billion larvae and impingement of over 125,000 fish. It is important for BOEM to note not only the potential adverse impacts of Sunrise Wind's cooling system, but to compare those impacts to the existing fossil fuel plants that this project would reduce the need for in Suffolk County. Ultimately, the Sunrise Wind cooling system would cause substantially less impact than the "No Action" alternative and would also offset the fossil fuel pollution in Northport and Port Jefferson, leading to improved water quality and air quality in local Long Island communities. CCE asks that BOEM include this benefit in the FEIS.	Thank you for your comment. As of 2021, Northport Power Station consists of four steam turbine units with a nameplate capacity of 387 MW each and one gas turbine unit with a nameplate capacity of 16 MW, for a total of 1,564 MW. Port Jefferson Power Plant has a nameplate capacity that totals 498 MW. Although these are the stated capacities and the annual capacity factors are unknown, it is unlikely that the SRWF could entirely replace these two facilities.

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BOEM-2022-0071-0158-0007	Expand on discussion of potential impacts to the Mid-Atlantic Cold Pool.	Additional information and analysis regarding the Cold Pool were added to the benthic section, 3.7.3, finfish section, 3.10.5, and marine mammal section, 3.11.3.
BOEM-2022-0071-0158-0021	The characterization of the NEFMC Habitat Area of Particular Concern (HAPC) is not accurate and should be corrected in the FEIS. The DEIS characterizes the NEFMC HAPC as "not actually defined by the presence of habitat but by the presence of offshore wind" (page 3-202). Per the Southern New England HAPC Framework document, the HAPC is defined as the presence of cod spawning and complex habitat within areas where offshore wind development is being planned and/or constructed. The spatial extent of this habitat area is limited to offshore wind lease areas, given that impacts associated with offshore wind development are of significant concern to the New England Council.	BOEM has defined the New England Fishery Management Council Habitat Area of Particular Concern as the presence of Atlantic cod spawning and complex habitat within areas where offshore wind development is being planned and or constructed.
BOEM-2022-0071-0158-0030	Entrainment of cooling water at the converter station is discussed on page 3-234. The analysis estimates adult equivalent losses for eight abundant or commercially important fish species. Appendix B (page B-125) includes a brief description for how adult equivalent losses are estimated. The accuracy of these predicted values is uncertain given the fecundity range used to estimate adult losses and the uncertainty levels around these estimates are not provided. It is also not clear why there are only 8 species included in the impact analysis versus the most abundant species found within the plankton data, or how "commercially important" (by revenue? or landings?) and "abundance" are defined.	Please see the Sunrise Wind EFH Assessment and Appendix N1 and N2 of the Sunrise Wind COP for more information on ichthyoplankton and entrainment.

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BOEM-2022-0071-0158-0031	The analysis references proximity to Cox Ledge. The location is referenced as a single point; however, this is misleading, and it should be represented by a polygon. The single point characterization of Cox Ledge does not provide a meaningful description of potential impacts given both cod spawning sites and complex habitats occur in locations that would do not directly overlap this point. Furthermore, the distance from this single point does not account for noise impacts on cod spawning as would otherwise be addressed if the area was represented as a larger polygon. It is possible that cod will not aggregate due to construction activities, and their vocalizations may therefore be reduced. Research by the Massachusetts Department of Marine Fisheries found that relatively minor disturbances from gillnet fishing interrupted the development of cod spawning aggregations (Dean et al. 2012); it is reasonable to expect construction activities may do so as well.	Thank you for your comment. BOEM and NMFS have worked together during the EIS process to address concerns related to Atlantic cod and Atlantic cod spawning. BOEM recognizes that Cox Ledge is not best represented as a single point, however, no polygon data is available for the entirety of Cox Ledge. The Final EIS discussed the impacts construction would have on Atlantic cod and displays data about habitat suitability for spawning Atlantic cod and Atlantic cod observation Data (See Section 3.7, *Benthic Resources* and 3.10, *Finfish*). Additionally, please see Appendix H for proposed mitigation measures for Atlantic cod.
BOEM-2022-0071-0229-0010	Finfish, Invertebrates and Essential Fish Habitat: BOEM continues to espouse the illusion that climate change will "reduce reproductive output and increase individual mortality and disease occurrence" contrary to scientific peer reviewed data and utilize this as a "baseline condition" and "regional trend" for all analysis related to the proposed Project. Again, this is a corruption of NEPA and is not a true baseline. Potential future conditions do not serve as baselines. Further, contrary to BOEM's above conclusion, the fact is that "climate change" is projected to be a positive directional effect for some species, including longfin squid, illex squid, butterfish, black sea bass, and bluefish, among others. According to the DEIS, the Project area has been identified as essential Fish Habitat (EFH) for all of these exact species. Therefore, BOEM cannot insert its own	Text was updated in Section 3.10.1 to clarify the EFH Assessment is under consultation with NMFS. The draft EFH Assessment has been updated to address NMFS comments.

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	conclusion that the baseline of these stocks is declining or projected to decline due to climate change, which serves to downplay Project effects to the species, i.e. "the stocks were declining anyway, and the project would not have impacted that one way or the other". This assumption is in direct contradiction to peer reviewed scientific literature and climate vulnerability assessments on these stocks. BOEM should instead project that these stocks should be increasing over time if it projects climate change effects to increase over time. Therefore, projected climate change would serve to reduce these increases and cost the fishing community opportunity and revenue. We request that BOEM correct and re-analyze its assumptions, baseline impacts and Alternative impacts relative to this peer- reviewed scientific information. The DEIS states that "BOEM has prepared an EFH assessment for the Project" and relies on this "EFH assessment" for the DEIS.19 This is problematic, as NMFS is by law the agency designated with the authority to conduct EFH consultations/approvals. It is particularly problematic given the fact that BOEM's draft EFH assessment provided to NMFS was incomplete and, according to correspondence between the agencies dated October 7, 2022, had NMFS been provided with the updated and correct EFH assessment information consistent with the timeline under FAST 41, it would initiate its EFH consultation no later than February 16, 2023, two days after the public comment period ends for the DEIS. In that correspondence, NMFS states, "The draft EFH assessment is incomplete and requires substantial revisions before consultation can be initiated, as it does not include information necessary for our review. Although we have tried	

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	to provide a comprehensive review of the draft EFH assessment, our review was hampered by the significant deficiencies in the document and the lack of an independent analysis of impacts to EFH…. The provided draft EFH assessment does not include the mandatory elements required for such assessments pursuant to 50 CFR 600.920(e)… Consequently, substantial revisions to the assessment are required before EFH consultation can be initiated. Given the extent of revisions, and supporting analyses, necessary for us to deem the assessment complete, we recommend that you coordinate with us as soon as feasible on the revisions to the assessment." If BOEM is relying on this incomplete and regulatorily non-conforming EFH document in the DEIS, then all such analysis and conclusions regarding EFH in the DEIS are incorrect and insufficient for the purposes of NEPA. We therefore request that BOEM correct its deficiencies, create a regulatorily conforming EFH document, undergo EFH consultation on marine resources with NMFS, adjust its DEIS EFH section based on that new EFH document, and release a supplemental EIS for public comment to allow for public comment on an accurate under NEPA.	
BOEM-2022-0071-0229-0011	One of the issues not discussed in BOEM's current EFH document quoted in the DEIS, according to the above, is "site specific analysis (e.g., impingement and entrainment assessment for Atlantic cod eggs and larvae)." We discuss these impacts and our concerns with such impacts in our comments below on "Water Quality/Fisheries Impacts." We have significant concerns about how the proposed open cooling water intake system for the Project's offshore converter station (OCS-DC) would affect the recruitment and stock levels of species that our vessels commercially harvest, as three –	Potential Atlantic herring, Atlantic mackerel, and Atlantic butterfish entrainment estimates were projected, and adult equivalent entrainments were evaluated. The parameters used to evaluate the adult equivalent entrainment, such as instantaneous natural mortality and instantaneous fishing mortality rates at varying life stages, were acquired from the EPA Regional Benefits Analysis for the Final Section 316(b) Phase III existing facilities rule (USEPA 2006).

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	Atlantic herring, Atlantic mackerel, and Atlantic butterfish- have been identified by the developer as some of the most affected species by the proposed OCS-DC.	Adult equivalent losses were low for Atlantic Mackerel, less than one fish (0.04), and Atlantic butterfish, 39 fish. Atlantic herring had the highest adult equivalent loss (573 fish). However Atlantic herring are among the most abundant fish in the North Atlantic and projected adult equivalent loss accounts for well less than 1 percent of the current biomass. These results are located in Appendix B.
BOEM-2022-0071-0229-0015	According to a presentation given by the developer at a 2021 NYSERDA FTWG meeting, the developer's analysis found that "forage" species such as Atlantic herring and Atlantic mackerel would be most susceptible to entrainment of eggs and larvae in the OCS-DC. As both of these commercially important species are currently under rebuilding plans pursuant to the Magnuson Stevens Fishery Conservation and Management Act specifically due to low recruitment/fecundity and not due to overfishing, we request that a detailed analysis on impacts to each species and their projected recovery rate, including resulting fishery impacts, be conducted and published in a supplemental EIS. The developer's 2021 NYSERDA FTWG presentation also mentions cod, and that the entrainment rates are estimated to be highest in May through December, we also express concerns with the impacts to the cod stock, as this timing overlaps with cod spawning activity. Cod spawning activity begins in November through December, and according to NMFS' previous correspondence with BOEM regarding adjacent projects which would be applicable to this proposed Project, "impacts to spawning success could have long-term population	Potential Atlantic herring, Atlantic mackerel, and Atlantic butterfish entrainment estimates were projected, and adult equivalent entrainments were evaluated. The parameters used to evaluate the adult equivalent entrainment, such as instantaneous natural mortality and instantaneous fishing mortality rates at varying life stages, were acquired from the EPA Regional Benefits Analysis for the Final Section 316(b) Phase III existing facilities rule (USEPA 2006). Adult equivalent losses were low for Atlantic Mackerel, less than one fish (0.04), and Atlantic butterfish, 39 fish. Atlantic herring had the highest adult equivalent loss (573 fish). However Atlantic herring are among the most abundant fish in the North Atlantic and projected adult equivalent loss accounts for well less than 1 percent of the current biomass. These results are located in Appendix B. Atlantic cod entrainment analysis estimates that a total of up to 34,239 Atlantic cod larvae could

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	impacts for the species" particularly considering "unlike other spawning components, cod in Southern New England have increased in abundance during the last 20 years." Not all projects, and not all impacts, are created equal. Impacts to the one cod stock component that may be keeping the species going would be far more devastating to the stock than impacts on a less productive or less numerous stock component. We request that BOEM provide estimates of cod spawning and larvae mortality, and resulting species impacts, expected to result from the project and associated entrainment/temperature change due to the OCS-DC and detail its findings in a supplemental EIS made available for public comment.	be entrained on an annual basis which would result in 16.5 equivalent adults. To put these potential entrainment rates in context, one (1) large female Atlantic cod can produce 3 to 9 million eggs annually (See Section 3.10.5.2.2.). The adult equivalent losses for Atlantic cod are estimated to be 16.5 fish lost. These results can be found in Appendix B. The location, design, and operation of the cooling water discharge was selected to minimize the thermal plume size to the extent practicable and preventing thermal plume migration to the surface waters or benthos. For optimal performance of the CWIS, the discharge needs to be sited deep enough that it would be submerged in the 100-year wave event and at a sufficient distance away from the intake pipes to avoid heated effluent being subsequently withdrawn by the Seawater Lift Pump (SWLP). To identify the optimal location for the discharge, the Cornell Mixing Zone Expert System (CORMIX) was used to evaluate the mixing zone associated with multiple discharge locations in the water column. The assessment considered four different seasons using a 2 degrees Fahrenheit (°F) (1 degree Celsius [°C]) temperature differential (ΔT) threshold to delineate the extent of the mixing zone. The optimal location for the discharge was determined to be approximately 40 ft (12 m) below local mean sea level (LMSL).

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		At this optimized location, rapid and complete mixing occurs. The thermal plume would be contained to a distance of 87 ft (27 m) from the outfall and occupy a maximum area of 731 ft^2 (66.9 m^2) in a worst-case, slack tide scenario.
BOEM-2022-0071-0229-0016	In Appendix N2 of the COP, the 2022 document prepared by the developer entitled "Ichthyoplankton Entrainment Assessment" conducts some basic analysis of the issues discussed above, but does not fully quantify these impacts. It is a very basic document of only 25 pages that does not translate the findings into any substantial analysis or potential stock impacts. However, the document implies that the species "expected to be the most susceptible to entrainment impacts associated with the OCS-DC include Atlantic herring (Clupea harengus), red hake (Urophycis chuss), Atlantic mackerel (Scomber scombrus), and silver hake (Merluccius bilinearis)" are not commercially important species by immediately following with "the commercially important species whose larvae could be most susceptible to operation of the OCS-DC include yellowtail flounder (Limanda ferruginea), summer flounder (Paralichthys dentatus), and Atlantic butterfish (Peprilus triacanthus)". This is an entirely faulty assumption, as Atlantic herring, Atlantic mackerel, and silver and red hake all support important commercial fisheries managed by the New England and Mid Atlantic Fishery Management Councils.Seafreeze vessels in particular engage in two of the fisheries- Atlantic herring and Atlantic mackerel- that the developer documents suppose to be non-commercial. If the document is faulty on that very simple subject, we do not	To evaluate the potential entrainment during operational OCS-DC withdrawals, species abundance data was obtained from the NOAA National Centers for Environmental Information (NCEI) electronic database. This database includes data collected by NOAA's Marine Resource Monitoring, Assessment, and Prediction (MARMAP) program from 1977-1987 and by the Ecosystem Monitoring (EcoMon) program from 1995 through 2017 throughout the North Atlantic region. There is no abundance information available for invertebrates to calculate potential entrainment. The annual Atlantic butterfish entrainment estimate was calculated to be 318,433 larvae (Appendix B). BOEM used this estimate to calculate how many equivalent adult butterfish would be impacted. It was estimated that a total of 39 butterfish could potentially be impacted by the OCS-DC annually (Appendix B).

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	have confidence that it is correct on any more complicated aspects of analysis. Furthermore, it does not include "l[]arger marine invertebrates, such as the Atlantic sea scallop" in the scope of its "analysis" despite the fact that BOEM's DEIS identifies Atlantic sea scallops as producing $3.2 million of revenue in the lease area. However, we particularly voice our concerns with the significant number of butterfish larvae projected to be entrained by the OCS-DC according to that document. A table from that document, reproduced below,shows butterfish larval death alone (incorrectly written as "bufferfish") as driving the entire "Atlantic" species mortality for a good part of the year. As a company whose vessels rely heavily on the butterfish fishery and which are responsible for the majority of all US landings for that stock, we are very concerned. The butterfish stock has recently undergone a research track assessment by the Northeast Fisheries Science Center, and butterfish recruitment (i.e. eggs/larval/young of the year production) was a major focus of that assessment. Any Project induced impacts to that recruitment could have impacts on future stock status and stock assessments. We therefore request that BOEM conduct the necessary analysis to demonstrate quantified impacts to the butterfish stock as a result of the Proposed Action and include such analysis in a supplemental EIS.	
BOEM-2022-0071-0232-0016	Deoxygenation in the lower-level water layer occurs in wind farms (Daewel, 2022). Deoxygenation can cause large-scale fish die-offs. BOEM does not adequately consider the impact of deoxygenation on fisheries. This project is not consistent with the conservation of biodiversity and marine life implied in the Executive Order.	The influence of wind turbines on mixing and turbulence downstream of turbines and within a wind farm is an important area of ongoing investigation. Research on this topic has largely focused on European wind farms and not on the unique characteristics of the Mid-Atlantic Bight.

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		However, research has consistently shown that the wind-wake effect influences stratification, and consequently, water quality, but that the influence is highly site specific. The results from Daewel et al. (2022) are not directly applicable to the SRWF area because that modeling study was based on the North Sea in an area that was known to already contain low dissolved oxygen (i.e., a bathymetric depression in the central North Sea). Further, Daewel et al. (2022) noted that in other areas of the North Sea, the specific hydrodynamic conditions could lead to higher DO levels. While wind farms do likely influence stratification, nutrients, and primary productivity, the actual impacts in the Mid-Atlantic Bight are currently unknown. Additional discussion has been added on this in Section 3.5.3.2 and Section 3.10.5.2.2.
BOEM-2022-0071-0232-0017	The DEIS minimizes the impact of EMFs and only considers local impacts. EMF's could mask the ability for EMF-sensitive species to appreciate the earth's electromagnetic field. Sharks and other long-range migratory species use the earth's magnetic field to navigate. If local EMF's overwhelm the faint alterations in the earth's magnetic field that alert species to their location, then the project could devastate their ability to navigate, find found sources, and procreate. BOEM needs to consider the EMFs from a more global perspective.	Thank you for your comment, more information about EMF effects on aquatic organisms is included in the Final EIS.
BOEM-2022-0071-0232-0032	Cod, the hallmark fishery of New England and the economic engine that propelled the Northeast into prosperity, will potentially suffer extinction under the current plan to develop	A schedule of construction activities at Sunrise Wind, Revolution Wind, and South Fork for the onshore facilities, export cables, offshore

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	the region around Coxes ledge (Dlouhy, 2014). The South Fork, Revolution, and now the Sunrise Wind farms' footprint will surround this critical marine habitat. Cod spawn in the Cox ledge region and rely on acoustic communication during this ritualized and sensitive behavior (Zemeckis, 2014). Noise from construction and operations of turbines could interfere with their communication and have "population-level impacts on Southern New England Atlantic Cod," (Chiarella, 2021). The DEIS does not consider the cumulative impact of Revolution Wind, South Fork, and Sunrise Wind, nor does it consider interactions between multiple stressors.	foundations, inter-array cables, WTG installations, and the OSC-DC were compared. There is no overlap between the Sunrise Wind and South Fork construction schedules. There is overlap during the construction of the onshore facilities at both Sunrise Wind and Revolution Wind; however, these are remote from each other and will produce no overlapping impacts. There is also overlay during the construction of the export cables between Sunrise Wind and Revolution Wind, but these cables are approximately 16 mi (25.7 km) apart at their closest point. The proposed construction of the offshore foundations and inter-array cables at both Projects overlap. The timing of the installation of the WTGs or OSC-DC does not coincide with the Projects; however, the installation of offshore foundations and the inter-array cables have similar timing. In some cases, this work could be as close as 2-3 mi (3.2-4.8 km) apart. Results from the sound modeling show that injury from a single strike is limited to 70 meters from a pile for both winter and summer seasons, and injury from prolonged cumulative exposure (over 24 hours) extends as far as 5.8 mi (9.4 km) from the pile during the winter water profile. Modeling indicates that behavioral effects on fish could occur up to 4.7 mi (7.5 km) from the pile source during the winter and 3.2 mi (5.2 km) from the pile source during the summer.

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		Within this area, it is likely that some level of behavioral reaction is expected and could include startle responses or migration out of areas exposed to underwater noise (Hastings and Popper 2005). Mitigation measures such as ramp-up procedures will allow mobile resources to leave the area before full-intensity pile-driving begins. The Project will use bubble curtains, hydro-dampers, and AdBm Helmholtz resonators to reduce noise propagation. The Project is committed to achieving ranges associated with 10 dB of noise attenuation.
BOEM-2022-0071-0242-0011	Select Alternative C-2 to reduce impacts to spawning Atlantic cod habitat;	Thank you for your comment.
BOEM-2022-0071-0242-0066	The Draft EIS for Sunrise Wind provides a reasonably detailed assessment of the anticipated impacts to benthic resources, invertebrates, finfish, and essential fish habitat (EFH). In our scoping comments, we recommended that BOEM provide a specific analysis of impacts to Atlantic cod and other species of concern; we appreciate that BOEM has emphasized the impacts to Atlantic cod throughout the Draft EIS. As discussed below, for the purposes of mitigating impacts to benthic resources, finfish, invertebrates, and EFH, we recommend that BOEM select Alternative C: Fisheries Habitat Impact Minimization Alternative (Habitat Alternative), and specifically Alternative C-2. The Sunrise Wind Farm Project overlaps in part with Cox Ledge, which contains important complex habitat and Atlantic cod spawning habitat. Because Alternative C-2 would avoid, minimize, and mitigate impacts to	Thank you for your comment. BOEM is in consultation with NMFS through the EFH and Biological Assessments, as well as in communication for the development of alternatives to reduce impacts to Atlantic cod habitat.

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	such habitats–including impacts from the presence of structures, noise, anchoring and cable emplacement, etc.–more so than the other alternatives, BOEM should select this option. We also urge BOEM to require Sunrise Wind to undertake several mitigation and monitoring measures identified in the Draft EIS. We note that the Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies, such as BOEM, to consult with NMFS on activities that could adversely affect EFH. NOAA defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." The Sunrise Wind Farm and the Sunrise Wind Export Cable (SRWEC) overlap with EFH designated for many species, including several overfished fish populations such as Atlantic cod, ocean pout, winter flounder, witch flounder, and yellowtail flounder. There are also several fish species listed under the ESA that are present in the Project Area, including giant manta ray, Atlantic sturgeon, Atlantic salmon, oceanic whitetip shark, and shortnose sturgeon. NOAA also identifies habitat areas of particular concern (HAPCs), which are high priority areas for conservation, management, or research because the areas are rare, sensitive, stressed by development, or important to ecosystem function. HAPCs are discrete subsets of EFH that provide important ecological functions or are especially vulnerable to degradation. While HAPCs are recognized due to their importance for conservation, management, and research, designation as an HAPC does not confer any specific habitat protection; however,	

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	regional management councils may take HAPCs into consideration when minimizing adverse impacts from fishing.	
BOEM-2022-0071-0242-0067	The proposed SRWEC will cross areas that have been designated HAPC for adult and juvenile summer flounder in New York state waters. The Mid-Atlantic Fishery Management Council has identified HAPC for summer flounder as "all native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH." Additionally, in July 2022, NEFMC approved a proposed HAPC that overlaps offshore wind-energy lease sites in southern New England, including Sunrise Wind. NEFMC selected this area "to highlight its concerns over potential adverse impacts from offshore wind development on: (1) sensitive hard-bottom habitats; and (2) cod spawning activity." In addition to Atlantic cod, this proposed HAPC emphasizes the importance of complex habitat on the egg, juvenile, and adult life stages of species ranging from herring and scallops to monkfish, skates, winter flounder, and red hake.	Thank you for this comment, this information is included in the EIS and EFH.
BOEM-2022-0071-0242-0070	The Draft EIS observes that an active Atlantic cod spawning ground has been identified in a broad geographical area that includes Cox Ledge and surrounding areas. BOEM is currently conducting a telemetry study of Atlantic cod in the area of Cox Ledge to better understand cod use of the habitats in the area. Two years of data have been collected to date. Although there are not yet formal reports analyzing the data, Atlantic cod have been detected in the Northwest corner of the Sunrise Wind	Thank you for your comment. Data from these studies have been used to determine Alternative C-3 to reduce impacts on Atlantic cod habitat. Cumulative impacts on the Atlantic cod fishery are discussed in Chapter 3.

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	Project Area. The Draft EIS explains that because of Atlantic cod spawning site fidelity, habitat alteration and seafloor disturbance from offshore construction activities could result in a loss of spawning habitat for Atlantic cod. However, because of the availability of similar surrounding habitat, BOEM expects that project activities will not result in measurable impacts on spawning Atlantic cod. According to BOEM, "non-lethal impacts on EFH from seafloor preparation activities are expected to be short-term, as any effects would cease shortly after seafloor preparation is completed in a given area and only a small portion of the available habitat in the area would be disturbed." While BOEM assumes that any impacts to spawning cod resulting from habitat disruption from construction will be low because of the availability of similar surrounding habitat, there are planned offshore wind projects in other areas that overlap Cox Ledge including the South Fork Wind and Revolution Wind projects. In the Final EIS, BOEM should assess how the cumulative impacts from the construction activities for these three projects will affect the spawning cod habitat and reproductively isolated spawning cod stock in the northwestern portion of the planned Sunrise Wind Project Area and elsewhere on Cox Ledge. Additionally, BOEM should revise its conclusions on the effects of construction activities on Atlantic cod to include the results from the final report on the Atlantic cod telemetry study. Further, if necessary, BOEM should adjust its recommendations on EFH and benthic resources mitigation measures to incorporate these revisions.	

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BOEM-2022-0071-0242-0071	The presence of WTG structures could also cause hydrodynamic effects. Hydrodynamic effects occur when structures cause changes in current speed, wave height, and sediment transport. The Draft EIS notes that as currents flow by offshore wind structures, it can leave wakes in the immediate area, which can "increase the potential mixing of the bottom and surface layers of the water column with the potential to impact stratification, nutrient circulation, and possible larval dispersal." It also finds that hydrodynamic turbulence resulting from offshore wind development is a topic of emerging concern because of potential effects on the Mid-Atlantic Bight cold pool. The Draft EIS explains that the cold pool "is a mass of relatively cool water that forms in the spring and is maintained through the summer by stratification" and that the "cold pool supports a diversity of fish and other marine species that are usually found farther north but thrive in the cooler water it provides." It observes that several lease areas within the Rhode Island/Massachusetts Wind Energy Areas are located on the approximate northern boundary of the cold pool. The Draft EIS recognizes that the potential effects of offshore wind development on the cold pool is a topic of emerging interest and ongoing research and that potential changes to cold pool dynamics resulting from offshore wind activities, "should they occur, could conceivably result in changes in benthic habitat suitability and fish community structure." In the Final EIS, BOEM should attempt to quantify the impacts to the cold pool from WTG structures and include such impacts in its impact level ratings. Unlike the Revolution Wind Draft EIS, the Sunrise Wind Draft	Further discussion on hydrodynamic effects on finfish and EFH is discussed in Section 3.10.5.2.2 of the Final EIS.

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	EIS provides only limited analysis of the potential effects of hydrodynamic impacts on spawning fish populations in the vicinity of the proposed project's infrastructure. For example, the Revolution Wind Draft EIS notes that hydrodynamic effects caused by the presence of WTG structures could alter dispersal patterns for pelagic and demersal eggs and larvae, which could influence the productivity of some spawning fish populations. The Revolution Wind Draft EIS also observes that WTG structures have the potential to alter stratification patterns that support the base of the marine food web and that these changes in circulation patterns have the potential to negatively affect the reproductive success of numerous fish and invertebrate species. The Revolution Wind Draft EIS further recognizes that there is a concern that hydrodynamic impacts could potentially lead to negative population-level effects on the reproductively isolated cod spawning stock on and around Cox Ledge, but that population-scale impacts are unlikely. The Final EIS for Sunrise Wind should provide similar analysis on the impacts to spawning fish populations from hydrodynamic turbulence. Moreover, in the Final EIS, BOEM must provide more detailed analysis of the impacts from hydrodynamic effects on fish stocks that spawn in specific locations of the Sunrise Wind Farm, and particularly the reproductively isolated Atlantic cod spawning stock in and around Cox Ledge.	
BOEM-2022-0071-0242-0072	Underwater noise from anthropogenic sources, including from offshore wind development, can have a variety of effects on marine fishes, including behavioral impacts, masking of communication or other biologically-important sounds, physiological changes, hearing loss, and physical injuries.	A number of mitigation initiatives will be deployed during pile driving to address noise impacts during pile driving on Atlantic cod spawning. Ramp up procedures during pile-driving activities will be used, allowing mobile

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	Noise impacts to fish vary depending on the type of fish species. The hearing specialist group of fish, which includes Atlantic cod, hake, and black sea bass, rely on sound for communication and other behaviors and, thus, are more susceptible to noise impacts. Atlantic cod, in particular, have relatively strong hearing abilities, over a frequency range that overlaps with many forms of anthropogenic noise, including pile-driving, vessels, and wind turbine operation. Moreover, as recognized by BOEM, "[n]oise impacts could be greater if they occur in important spawning habitat, occur during peak spawning periods, and/or result in reduced reproductive success in one or more spawning seasons, which could result in long-term effects to populations if one or more year classes suffer suppressed recruitment." There are multiple studies pointing to reasons for concern over possible impacts of wind farm-related noise on cod spawning. Experimental work exposing captive adult cod during the spawning period to playback of noise over frequencies typical of shipping and wind turbine operation has shown negative impacts on egg production and fertilization rates in adult cod, reducing viable embryos by 50 percent. Playback of recordings of ship noise has shown impacts on growth and body shape in larval cod as well as increased susceptibility to predators and hence implications for compromised survival. Spawning behavior in the wild is known to be generally sensitive to disruption: fishing activity on spawning grounds, for instance, has been shown to disrupt spawning even for those fish not captured.	resources to leave the area before full-intensity pile-driving begins. The Project will use bubble curtains, hydro-dampers, AdBm, Helmholz resonators to reduce noise propagation during pile driving. The Project is committed to achieving ranges associated with 10 dB of noise attenuation. Mitigation zones established for all species will be applied, depending on the season in which work is performed: summer (May-November) or winter (December-April). No pile installation will occur from 01 January to 30 April. An Atlantic Cod Spawning Monitoring Plan will be developed to monitor for Atlantic cod aggregations that are indicative of spawning behavior between November 1 and March 30 of each year. The objective of the plan is to detect Atlantic cod aggregations and avoid or minimize the above-listed activities in any area with aggregations of Atlantic cod indicative of spawning behavior. The plan will include details on detection thresholds (e.g., density and location) of spawning Atlantic cod aggregations that would trigger the adaptive management of activities.

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BOEM-2022-0071-0242-0073	In addition to these potential direct impacts on cod spawning-related physiology and behavior, noise could lead to interference of cod acoustic communication. Cod produce vocalizations (grunts) during spawning that overlap in frequency with anthropogenic noise. Measurements of cod grunts along with shipping and ambient sound levels made during spawning periods in the vicinity of Stellwagen Bank suggest that the distances over which cod can detect grunts might be reduced due to masking by vessel noise.280 Cod grunts are thought to serve a role in courtship and attracting mates, and interference of this communication by wind farm-related noise could potentially compromise spawning success and hence population health. Studies relating to European wind farms have suggested that operational noise from wind turbines might be detectable by cod to distances of 4-13 km. In one study, tracking of small numbers of tagged cod at a Belgian wind farm during periods when individual wind turbines were out of operation relative to periods before and after suggested no evidence of behavioral avoidance. In contrast, another study observed an increase in catchability of cod within 100 m of a wind turbine when it was not operating. Overall, impacts within the range of noise detectability might more likely relate to masking of cod calls and reduction of communication ranges than to avoidance or similar behavior. The Draft EIS's conclusions on the likely noise impacts on Atlantic cod and other species from the Sunrise Wind project are largely consistent with these studies. The Draft EIS observes	A number of mitigation initiatives will be deployed during pile driving to address noise impacts during pile driving on Atlantic cod spawning. Ramp up procedures during pile-driving activities will be used, allowing mobile resources to leave the area before full-intensity pile-driving begins. The Project will use bubble curtains, hydro-dampers, AdBm, Helmholz resonators to reduce noise propagation during pile driving. The Project is committed to achieving ranges associated with 10 dB of noise attenuation. Mitigation zones have been established for all species and would be applied depending on the season in which work is performed: summer (May-November) or winter (December-April). No pile installation will occur from 01 January to 30 April. An Atlantic Cod Spawning Monitoring Plan will be developed to monitor for Atlantic cod aggregations that are indicative of spawning behavior between November 1 and March 30 of each year. The objective of the plan is to detect Atlantic cod aggregations and avoid or minimize the above-listed activities in any area with aggregations of Atlantic cod indicative of spawning behavior. The plan will include details on detection thresholds (e.g., density and location) of spawning Atlantic cod aggregations that would trigger the adaptive management of activities.

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	that "Atlantic cod, hake, and black sea bass belong to the hearing specialist group and rely on sound for communication and other important behaviors," including spawning. It explains that pile driving and other noise impacts can result in acoustic masking for Atlantic cod, whereby cod "fail to detect biologically important acoustic cues, such as spawning communications." According to the Draft EIS, noise impacts to Atlantic cod from impact pile driving "could be greater if pile driving occurs in spawning habitat, occurs during peak spawning periods, and/or results in reduced reproductive success in one or more spawning seasons, which could result in long-term effects to populations if one or more-year classes suffers suppressed recruitment." Moreover, because of Atlantic cod spawning site fidelity, "[a]lteration of the ambient noise environment during evening spawning periods could interfere with communication and alter behavior in ways that could disrupt localized cod spawning aggregations." BOEM concludes that prohibiting pile driving from January 1 to April 30 to protect North Atlantic right whales will also protect spawning Atlantic cod, which primarily spawn from December to May in southern New England . BOEM has not conducted a separate analysis on the extent to which either Habitat Alternative would reduce noise impacts to Atlantic cod, and specifically spawning cod. In the Final EIS, BOEM should improve its analysis of the extent to which the two Habitat Alternatives would specifically reduce noise impacts to Atlantic cod spawning stocks in and around Cox Ledge, and use this to advise its decision-making BOEM should also incorporate data from the ongoing cod telemetry study	

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	into this analysis. The research on noise impacts on cod spawning, discussed above, suggests that avoiding the construction and operations of WTGs in Cox Ledge, and the noise associated with such activities, through selection of either Habitat Alternative, has the potential to significantly reduce impacts to the cod spawning population in that area.	
BOEM-2022-0071-0242-0075	Sunrise Wind's COP proposes that the offshore AC to DC conversion station utilize a cooling system that is open loop, which will have a design intake flow of approximately 8.1 million gallons per day. The heated effluent is subsequently discharged back into the receiving waters. Open loop cooling systems of this kind have long been shown to have negative impacts from entrainment and impingement of marine life, particularly eggs, larvae, young juvenile fish, and invertebrates with planktonic life stages. Moreover, the discharge of warmer water into the ocean can negatively impact microorganisms and finfish and higher energy orders above such species. In comments on the scoping for Sunrise Wind Farm, we requested that in order to minimize impacts to EFH and finfish, BOEM should require Sunrise Wind to redesign the converter station to use a closed loop cooling system. BOEM, however, dismisses this potential alternative, explaining in the Draft EIS that a closed loop system for Sunrise Wind "is not technically and economically feasible or practical." Further, although BOEM acknowledges in the Draft EIS that Sunrise Wind's proposed open loop cooling system could result in the entrainment and impingement of ichthyoplankton and juvenile and adult fish, BOEM did not quantify such impacts. BOEM also did not quantify the impacts resulting from the heated effluent	Mitigation measures to reduce impacts to finfish and EFH from the converter station were included in the design of the facility. The OCS-DC was designed to have a through screen velocity of 0.43 ft/s (0.13 m/s is below the threshold required for new facilities defined at §125.84(c)) and is therefore protective against the impingement of juvenile and adult life stages of finfish. Accordingly, only the species with egg or larval life stages present in the vicinity of the OCS-DC would be susceptible to entrainment. The water depth of the intake pipe openings approximately 30 ft (10 m) above the seafloor was selected to minimize entrainment of ichthyoplankton and to take advantage of the cooler water temperatures found at depth to minimize water withdrawal volumes. The intake pipe will be equipped with a VFD. The VFD technology allows the cooling water intake of the OCS-DC to be optimized as it relates to minimizing water withdrawals as power output and source water temperature varies temporally. Each of the intake pipes would have two Coarse Filters consisting of a Super Duplex Stainless Steel

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	that is discharged into the waters surrounding the conversion station. In the Final EIS, BOEM should provide a more detailed explanation for its conclusion that a closed loop cooling system is not technically and economically feasible or practical. BOEM should also improve its analysis of the entrainment and impingement impacts resulting from cooling water intake for the proposed open loop cooling system, as well as the impacts resulting from heated effluent discharge, and quantify such impacts. Finally, BOEM should assess the extent to which mitigation measures can be developed to mitigate any impacts from the open loop cooling system.	vertical housing that encases a series of three banks of wedge wire filter tubes designed to filter suspended solids and organisms larger than 500 microns. The HZI is highly localized and does not extend within 15 ft (5 m) of the pre-installation seafloor grade or 98 ft (30 m) of the surface. Only eggs and larvae that enter the localized HZI would be susceptible to entrainment; species whose ichthyoplankton are buoyant or benthic would not be affected. The hydrothermal modeling completed for the NPDES Permit estimated that the thermal plume would not extend beyond the regulatory mixing zone of 330 ft (100 m) as defined by the Ocean Discharge Criteria in the NPDES regulations; thus, effects on water quality beyond the regulatory mixing zone are not anticipated.
BOEM-2022-0071-0242-0076	Alternative C-2 would result in reduced impacts to complex benthic habitats, the EFH that overlap with such areas, and finfish, and we urge BOEM to select this alternative to mitigate impacts to these resources. Under Alternative C-1, 8 WTGs would be excluded from development in a contiguous area of complex habitat in the northwestern corner of the Sunrise Wind Farm, which has the highest density of boulders and where preliminary data suggests the presence of Atlantic cod spawning activity. Alternative C-2 would not only exclude from development the locations of these 8 WTGs, but also relocate an additional 12 WTGs from the northwestern portion of the Sunrise Wind farm	Results of surveys on the eastern side were not available when Draft EIS was written, Alternative C-3 was developed and results from the eastern surveys are included in the Final EIS.

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	to the eastern side of the lease area. BOEM finds that both Alternative C-1 and C-2 would reduce the total area of complex habitat disturbed by WTGs and the interarray cable. Whereas under the proposed action, 43 percent of the acreage experiencing long-term impacts from the Sunrise Wind Farm would be complex habitat, Alternatives C-1 and C-2 would reduce the acreage of complex habitat affected to 36 percent and 24 percent, respectively. The Draft EIS finds that relocating up to 20 WTG positions from areas of higher complexity habitat to areas of soft bottom under Alternative C-2 "could reduce the overall adverse impacts of the WTG array on benthic resources." The Draft EIS also concludes Alternative C-2 could potentially result in reduced overall impacts to finfish, invertebrates, and EFH due to the change in layout aimed at reducing the number of WTGs located in presumed Atlantic cod spawning locations and complex bottom habitats. Whereas under the Proposed Action, impacts to finfish, invertebrates, and EFH would range from negligible to moderate, BOEM finds that under Alternative C-2 (or Alternative C1), impact levels would decrease and range from negligible to minor. Alternative C-2 would avoid, minimize, and mitigate impacts to complex habitats resulting from the presence of structures to a greater extent than the Proposed Action, which in turn would reduce the impacts from the presence of structures to habitat-forming invertebrates and finfish, including the geographically isolated Atlantic cod spawning stock on Cox Ledge. The fact that complex habitats may take a decade or longer to recover from	

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	offshore wind development activities provides additional justification for selecting Alternative C. Further, although BOEM has not studied the extent to which Alternative C would reduce noise impacts to Atlantic cod, research suggests that siting fewer WTGs in the complex habitats that overlap with Cox Ledge would reduce construction and operation noise impacts on spawning cod populations when compared to the Proposed Action. Accordingly, BOEM should select Alternative C-2.	
BOEM-2022-0071-0242-0078	For the Revolution Wind project, BOEM proposes sound field verification and passive acoustic monitoring for finfish and EFH. The sound field verification would require Revolution Wind to submit an acoustic monitoring and sound field verification plan at least 90 days prior to initiating underwater noise producing construction activities, which would contribute to improving understanding of the nature and duration of noise impacts and provide the information necessary to ensure that effects do not exceed certain levels. Additionally, BOEM proposes that Revolution Wind prepare a passive acoustic monitoring plan to record ambient noise and fish vocalizations within the Revolution Wind Farm. The plan would include the deployment of moored or autonomous passive acoustic devices capable of detecting the vocalizations of spawning cod, and potentially other species. Passive acoustic monitoring devices would be implemented prior to and during the construction period and continue for at least three years of project operations once construction is completed. Inexplicably, similar acoustic monitoring measures are not proposed for the Sunrise Wind project. As these measures will help improve our understanding of the impacts of offshore	Please see Sunrise Wind EFH Assessment, APMs for Construction and Operation of the SRWF, SRWEC-OCS, and SRWEC-NYS Project Components, specifically the "PAM for impact pile driving." The SRWF would include: 4-hour PAM operator rotations for 24-hour operation vessels, deployment of PAM systems outside the perimeter of the shutdown zone, and a PAM operator on duty to conduct acoustic monitoring. Acoustic monitoring will occur 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, which are all protective of EFH and EFH-designated species.

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	wind construction and operations, including noise impacts, on EFH and finfish species, BOEM should require these monitoring measures. In addition to these monitoring efforts, because the area of the Sunrise Wind Farm that overlaps with Cox ledge is an important Atlantic cod spawning habitat, BOEM should conduct Atlantic cod spawning surveys in the area of the Sunrise Wind Farm to further our understanding of the impacts of offshore wind on cod spawning, and inform the development of adaptive management mitigation measures, if needed. Additionally, for Revolution Wind, BOEM states that, based on acoustic monitoring and sound field verification, it could require additional adaptive measures to avoid disrupting spawning aggregations of Atlantic cod. It suggests that based on the acoustic monitoring, it may require Revolution Wind to "restrict pile-driving activity during the cod spawning season to avoid and minimize adverse impacts on Atlantic cod spawning and reduce broader population level-effects," but that this adaptive approach "has not been fully developed and the avoidance and minimization measures have not been implemented and tested." Similarly, for Sunrise Wind, if based on monitoring BOEM determines that time-of-year restrictions will reduce impacts to cod spawning, BOEM should require Sunrise Wind to implement such adaptive restrictions on construction activities. Beyond the monitoring measures already contemplated, BOEM, in consultation with Rhode Island, Massachusetts, and New York fishery managers and NMFS, should determine whether other monitoring measures are needed to document and	

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	determine impacts to benthic habitat, invertebrates, finfish, and EFH from the Sunrise Wind project.	
BOEM-2022-0071-0248-0002	RODA is a coalition of more than 200 fishery-dependent companies, associations, and community members committed to improving the compatibility of new offshore development with their businesses. Members of our coalition operate in federal and state waters of the New England, Mid-Atlantic, and Pacific coasts.	Thank you for your comment.
BOEM-2022-0071-0248-0044	The DEIS indicates minor impacts resulting from entrainment. This is based on estimates for egg and larval species. "Even though over 1 million of the abundant Atlantic herring eggs and larvae are estimated to be entrained at the OCS-DC that only equates to less than 600 adult Atlantic herring." It bears noting the population of Atlantic Herring is currently overfished and the stock is under a rebuilding plan. The most recent estimates of stock biomass from NOAA stock assessments show a declining trend: 2018 - 141,473 metric tons, 2020 - 77,883 mt, and 2022 - 39,091 mt35. The entrainment of over 1 million Atlantic herring eggs during a time the stock is under a rebuilding plan and biomass is showing a steady downward trajectory, seems inappropriate. Even if we assume the DEIS is correct when it estimates the loss of 600 adult Atlantic herring, those 600 adult herring will be integral to rebuilding of the stock. To the extent the diet of the adult Atlantic herring influences its fecundity, potential impacts on zooplankton and other food sources needs to be accounted for as well. We recommend additional analysis on entrainment potential and impacts to ALL stocks which may be entrained. Analysis of stock level impacts resulting from entrainment can then inform potential fishery and ecosystem impacts from those impacts.	Based on equivalent adult estimates of Atlantic herring, stock level impacts are not expected from entrainment.

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BOEM-2022-0071-0251-0003	An open cooling water intake system, such as the CWIS system slated for Sunrise Wind, has no place in the ocean. In NYS, in 2011, open water-cooling systems were banned for new builds on New York State land by then DEC Commissioner Joe Martens. 8.1 mil gals per day released as 90 degree effluent with only a 500 micron mesh to protect fish eggs and larvae is not acceptable under any circumstances. There isn't any analysis for the project other than what was done by a third party consultant, which is unacceptable. If a project of this nature is not allowed for new builds in New York State, it should not be allowed a loophole to sully the ocean, kill millions perhaps billions of fish yearly, and then be allowed to plug in to New York State. This entire CWIS must be evaluated by BOEM with regard to fish stocks, fish recruitment, losses of young of the year and its effect on Atlantic Cod stocks, specifically the DPS of Southern New England	Mitigation measures to reduce impacts to finfish and EFH from the converter station were included in the design of the facility. The OCS-DC was designed to have a through screen velocity of 0.43 ft/s (0.13 m/s) which is below the threshold required for new facilities defined at §125.84(c) and is therefore protective against the impingement of juvenile and adult life stages of finfish. Accordingly, only the species with egg or larval life stages present in the vicinity of the OCS-DC would be susceptible to entrainment. The water depth of the intake pipe openings approximately 30 ft (10 m) above the seafloor was selected to minimize entrainment of ichthyoplankton and to take advantage of the cooler water temperatures found at depth to minimize water withdrawal volumes. The intake pipe will be equipped with a VFD. The VFD technology allows the cooling water intake of the OCS-DC to be optimized as it relates to minimizing water withdrawals as power output and source water temperature vary temporally. Each of the intake pipes would have two coarse filters consisting of a Super Duplex Stainless Steel vertical housing that encases a series of three banks of wedge wire filter tubes designed to filter suspended solids and organisms larger than 500 microns. The HZI is highly localized and does not extend within 15 ft (5 m) of the pre-installation seafloor grade or 98 ft (30 m) of the surface. Only

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		eggs and larvae that enter the localized HZI would be susceptible to entrainment; species whose ichthyoplankton are buoyant or benthic would not be affected.
BOEM-2022-0071-0283-0001	Thank you. My name is Meghan Lapp. I represent Seafreeze. My name is spelled M- E- G- H- A- N L- A- P- P. Thank you very much. I want to raise some very significant concerns that we in the fishing industry have with this project, particularly with the open- water cooling system that the substation is supposed to have. Open water- cooling systems are illegal in New York state waters. So, it's kind of troubling that New York State would actually approve that type of open water- cooling system. In federal waters, it is supposed to emit 8.1 million gallons a day of 90-degree effluent. It will -- it is situated in an area that is very important for cod and cod spawning as was detailed by the Habitat Minimization Alternatives but an open water- cooling system will suck in the water where the cod larva and the cod eggs are located, it will cook them and then it will spit them out dead. This is going to have very, very significant impacts on the cod population on Southern New England. It could cause a stock collapse. We do not support having any open water- cooling systems allowed in any substation on this project. And I will reserve the rest of my comments for written comments. Thank you.	Thank you for your comment. The open water cooling system is discussed in regards to Finfish in Section 3.10.5.2.2 in the Final EIS. More information has been added to analyze impacts to Atlantic cod.

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BOEM-2022-0071-0283-0012	Hi, Adrienne Esposito, A- D- R- I- E- N- N- E E- S- P- O- S- I- T- O, Citizens Campaign for the Environment. And thank you for the opportunity to speak. I think that one thing -- and I know I testified a couple of days ago on the first hearing, but I' m going to add to my comments -- is it would be great for the Draft EIS to include what happens to our finfish and shellfish industry if we don' t have offshore wind. We've heard a lot of discussions today and rightfully so, about open- loop systems and closed- loop systems, but I think we fail to remember that we currently have fossil fuel- based power plants using open- loop systems. And so, it would be important, I think, for the DEIS to juxtapose next to the system that the wind farm would use, to the systems that our power plants are currently using. So, for instance, I think many people are unaware about how much entrainment and impingement of larval for shellfish and finfish as well as juvenile shellfish and finfish is actually occurring right now as we speak. For instance, the EF Barrett power plant on the south shore, and this is national grid's own data, they own the owners and the operators of these power plants, their own data shows that there's 906 million larvae that are dead or caused to be deceased by entrainment each year, as well as 160,000 that suffer impingement. That's in one power plant. Port Jefferson power plant, it' s 1 billion with a B, larval and shellfish, and finfish that go through entrainment and an additional 76,000 that suffer from impingement. And last but absolutely not least, the North Port power plant, which is the largest power plant, is 8.43 billion with a B, shellfish and larvae that are impinged from the open loop system that this power plant uses as well as an additional 127,100 that suffer from	Thank you for your comment. Since these projects are not related to the Sunrise Wind Project, we cannot make direct comparisons in the EIS but we appreciate you pointing this out in the public commenting process.

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	impingement. All of those larvae and juveniles, whether it's shellfish, lobster, winter flounder, cod, whatever it is, are killed from these power plants. Many of us believe that these power plants are sadly and unfortunately playing a role in the reduction of finfish and shellfish populations throughout Long Island and our Atlantic waterways. Since we know that shellfish and finfish utilize estuaries as nursery and breeding grounds, when these shellfish and larvae are sucked up into these open loop systems and killed, we know that the populations are decreased. So again, I think the DEIS in order to give a holistic comprehensive view, needs to illustrate what would happen with an open- loop system with offshore wind, with a comparable open- loop system with one of these power plants. And I think we' re going to see that all energy infrastructure has some impact on our environment, but it's up to us to choose the ones that have the least impact on our environment, and that's offshore wind. And that's one of the many reasons why environmental groups are supporting Sunrise Wind and transitioning away from dirty fossil fuels. It's not only about air emissions. It's not only about climate change. It's also about preserving fin fishing and the quality of our estuaries and waterways to preserve our maritime history, help fishermen, and the quality of water within those water bodies. Thank you for the opportunity to comment.	

O.6.13. Land Use and Coastal Infrastructure

Table O-22. Responses to Comments on Land Use and Coastal Infrastructure

Comment No.	Comment	Response
BOEM-2022-0071-0257-0006	The DEIS characterizes the use of a Highway ROW as a "previously disturbed and developed area" in the absence of environmental impacts from a utility installation along an "existing roadway" and transportation ROWs. (See DEIS at pp. 2-10, 3-179, 3-186, 3-364, 3-467, 3-479, and 3-595). The installation review procedures of a utility facility within the controlled access ROW are set forth in 17 NYCRR § 131.6 and each request is reviewed in a case-by case basis. The evaluation includes impacts to transportation safety impacts and the potential to compromise infrastructure integrity.3	Upon review of the Environmental Management and Construction Plan, pursuant to Article VII (16 NYCRR 85–88), which was approved in June 2023, BOEM has confirmed that onshore construction related impacts for the transmission cable and interconnection corridors will be limited to previously disturbed areas, to the extent practicable.
BOEM-2022-0071-0257-0008	The onshore linear alignment as described in the DEIS at pages 3-528 and 3-631 describes the onshore construction activities as having impacts to traffic and "vehicular traffic associated with construction activities would be comparable to typical roadway or utility construction work". This statement is unclear as to impacts on traffic safety and does not make a distinction between traffic impacts of construction on a highly congested region, such as Long Island and a sparsely populated, rural area. The DEIS at page 3-632 incorporates by reference the Environmental Management and Construction Plan (EM&CP) (from the NYS Article VII process) and a future MPT, thus acknowledging traffic impacts. NYSDOT will require a	Text in Section 3.18.5.1.1 (previously Section 3.6.5.5.1.1 of the Draft EIS) of the EIS has been revised to state "Vehicular traffic associated with construction activities would be comparable to typical roadway or utility construction work that would occur in a congested region," to make the distinction between traffic impacts in a congested region compared to a rural area. BOEM understands that NYSDOT will require a MPT submission that will evaluate the impacts to traffic safety for the Project.

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	MPT submission and will evaluate the impacts to traffic safety.	
BOEM-2022-0071-0257-0009	Alternate routing and specifically routes that do not involve longitudinal occupation of federal-aid controlled access highways, must be fully vetted as part of an exception request to NYSDOT's Utility Accommodation Plan. FHWA regulations at 23 CFR § 771.105(c) require "[a]lternative courses of action be evaluated and decisions be made in the best overall public interest based upon a balanced consideration of the need for safe and efficient transportation; of the social, economic, and environmental impacts of the proposed transportation improvement; and of national, State, and local environmental protection goals." The DEIS at page 2-42 (Table 2.2-1, "Alternatives that were Considered for Analysis in this Draft EIS but Not Analyzed") dismisses onshore transmission alternatives and describes the basis for the dismissal as a reference to DEIS Appendix P – USACE Summary Table of Alternatives Analysis. The DEIS Appendix P summation of the USACE (U.S. Army Corps of Engineers) review and issuance of permits for the onshore route of the utility facility is not instructive to determine viable alternatives alignments to the longitudinal installation of a utility facility within a controlled access Highway ROW. The DEIS at page 2-42 acknowledges that onshore transmission cable route alternatives were not identified "that would further reduce or avoid impacts to land use, sensitive environmental habitat, and cultural resources." The DEIS selection of the preferred alternative as "optimal" does	Sunrise Wind and NYSDOT have been working together since January of 2020 to ensure route selection, design specifications, and installation timelines for the Project are consistent with NYSDOT requirements and minimize impacts to the extent possible during construction and operation. On September 16, 2022, Sunrise Wind provided NYSDOT a written request with justification for an exception under the requirements of the Accommodation Plan for Longitudinal Use of Freeway Right-of-Way by Utilities (UAP). On April 11, 2023, the NYSDOT sent Sunrise Wind a response letter that indicated that due to the recent realignment of the Access Control Line along segments of the Long Island Expressway, the proposed longitudinal installation of the onshore facilities within the Long Island Expressway South Service Road is now outside the jurisdiction of the Federal Highway Administration (FHWA) and concurrence for an exception to the UAP will not be required. The letter further indicated that based on realignment, FHWA approval will only be necessary for the two proposed perpendicular crossings of the Long Island Expressway and Sunrise Highway. It will be necessary for Sunrise Wind to coordinate with NYSDOT to ensure that all required information to support FHWA approval of these two crossings is obtained and that the installation, operation, and decommissioning meets all NYSDOT conditions relative to the NYSDOT's Requirements for the Design and Construction of

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	not consider the impact to traffic safety and transportation infrastructure integrity. At NYSDOT's request, FHWA will review the accommodation request in accordance with 23 CFR Parts 645 and 771. Additionally, the request must demonstrate that the accommodation will not adversely impact the design, construction, operation, maintenance, or stability of the highway and that it will not interfere with or impair future expansion of the highway.	Underground Utility Installations within the State Highway Right-of-Way.
BOEM-2022-0071-0257-0010	NYSDOT has observed that the Revolution Wind DEIS, made available for public comment in September 2022, acknowledges that "The onshore elements of the Proposed Action are included in BOEM's analysis in the EIS to support analysis of a complete Project; however, BOEM's authority under the OCSLA only extends to the activities on the OCS." The Revolution Wind DEIS evaluates environmental impacts within the project envelope as described the project's Construction and Operation Plan (COP) and evaluates the onshore transmission line as a design envelope by acknowledging the ongoing evaluation of possible onshore routes. NYSDOT encourages BOEM to evaluate the onshore components of the Sunrise Wind transmission line by applying the project envelope as done in the Revolution Wind DEIS.	The onshore elements of the Proposed Action for the Sunrise Wind Project also evaluated the environmental impacts within the Project envelope as described in the Project's Construction and Operation Plan (COP). Section 2.2.1.1 of the COP describes the siting alternatives considered for the Project's onshore facilities and analyzed each alternative to come to the proposed onshore components of the Sunrise Wind transmission line as included in the Project Design Envelope. In this EIS, BOEM has evaluated the onshore components of the Sunrise Wind transmission line by applying the Project envelope as was done in the Revolution Wind Draft EIS.
BOEM-2022-0071-0065-0021	Throughout the scoping and EIS process, both Ørsted and BOEM collaborated with stakeholder groups and hosted a series of public information sessions for residents to learn more about the projects and provide feedback. CCE commends Ørsted for their community	Thank you for your comment.

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	outreach efforts and their continued commitment to keep diverse stakeholder groups, community leaders, and the public in-the-loop on ongoing updates as Sunrise Wind moves through the approval process. Due to sustained dialogue and commendable outreach efforts, Suffolk County and Brookhaven Town have already approved land-use agreements for the cable route for Sunrise Wind. The project has widespread support in municipalities that will be hosting the onshore landing and cable route.	
BOEM-2022-0071-0257-0001	The New York State Department of Transportation (NYSDOT) submits the below comments in response to the Bureau of Ocean Energy Management's (BOEM) Notice of Availability of a Draft Environmental Impact Statement (DEIS) for the review of a construction and operations plan (COP) for the Sunrise Wind Project (Project or Proposed Action) offshore New York. NYSDOT is a full partner with State and federal agencies in achieving climate goals and acknowledges the role of renewable energy projects in meeting those goals. In participating in the review of proposed renewable energy projects, NYSDOT retains its jurisdictional authority over the State highway system and maintains that the safety of the traveling public and the operational integrity of the transportation infrastructure is of foremost priority in the use of the corridors. NYSDOT submits a summary of the evaluative process for alternate uses of transportation corridors and comments to the DEIS as set forth below.	Thank you for your comment.

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BOEM-2022-0071-0257-0002	Access control to highways is one of the most significant design features contributing to the safety and traffic carrying capacity of a freeway system. As the State's highway oversight agency, NYSDOT has the responsibility to ensure that any decision related to utility accommodations within freeway right-of-way (ROW) receives due diligence in weighing the benefits and risks of all the various options and a thorough evaluation of alternatives to the occupation of a utility facility within a controlled access ROW. Pursuant to 23 CFR § 1.23(b), when the State acquires property for a highway project, the State must devote use of said property exclusively to highway purposes. The Sunrise Wind DEIS identifies an onshore transmission line alignment within the State Highway Right-of-Way. This alignment is described to include sections of a South Service Road of the Long Island Expressway (LIE) and requires an exception to the Federal Highway Administration (FHWA) approved NYS Utilities Accommodation Plan. The use of the Highway ROW for the longitudinal installation of a utility facility is subject to NYSDOT review and recommendation to FHWA for approval.	Thank you for your comment.
BOEM-2022-0071-0257-0003	The installation of a utility facility within the control access line requires FHWA approval for an exception to the federally-approved New York State Utility Accommodation Plan (NYS UAP) found at 17 NYCRR Part 131 (“Accommodation of Utilities Within State Highway Right-of-Way”). Utility facilities are defined in 17 NYCRR § 131.5(z). Each request for longitudinal occupancy of a	Thank you for your comment.

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	freeway by a non-communications utility must be submitted as a request for an exception to the current FHWA-approved NYS UAP. FHWA regulations at 23 CFR Part 645 Subpart B provide the process utility facilities must follow to be permitted to longitudinally occupy the right-of-way in a manner that is safe for the traveling public. An applicant's request to NYSDOT for an exception to the NYS UAP is an accommodation process consisting of requirements which must be satisfied to ensure that the utility facility does not "...impair the highway or interfere with the free and safe flow of traffic thereon" (23 CFR § 1.23(c)). When a utility facility crosses the control access line and installation is sought within the controlled access ROW (17 NYCRR § 131.6), then the installation shall be subject to 23 CFR Part 645, 17 NYCRR Part 131 and the nationally recognized standards in AASHTO (American Association of State Highway and Transportation Officials) in seeking an exception to the NYS UAP.	
BOEM-2022-0071-0257-0004	A utility facility installation within a State Highway ROW must meet the requirements of the NYSDOT Design Manual and the NYS Accommodation Plan for Longitudinal Use of Freeway Right-of-Way by Utilities (October 1995). The NYS Accommodation Plan (or Plan) is a federally-approved plan for the longitudinal installation of only communication lines within controlled access State Highway ROWs. A utility facility, other than a communication line, seeking longitudinal installation within the controlled access State Highway ROW will first need to obtain NYSDOT's agreement for	Thank you for your comment.

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	an exception to the Plan and NYSDOT will then seek FHWA approval of the exception request. NYSDOT will need to approve a Maintenance and Protection of Traffic (MPT) plan prior to any utility installation within a Highway ROW. Further review of the design will be required for placement of a utility facility on a bridge, overpass, or near a ramp structure.	
BOEM-2022-0071-0257-0005	FHWA and NYSDOT have entered into a five-year Programmatic Agreement entitled "Regarding the Processing of Actions Classified as Categorical Exclusions for Federal-Aid Highway Projects". Environmental determinations pursuant to Section 4(f) of the U.S. Department of Transportation Act of 1966, Section 106 of the National Historic Preservation Act, and Endangered Species Act Section 7 as listed in the Federal Environmental Approvals Worksheet (FEAW) must be completed for NYSDOT to determine if thresholds are exceeded, as set forth in Section IV(A)(1)(e) of the Agreement. Both NYSDOT and FHWA must approve the request. Further, the FHWA approval for an exception to the NYS UAP will require compliance with NEPA.2 The NYSDOT Transportation Environmental Manual (TEM) thresholds for at NEPA review are found in the FEAW and provides the framework for evaluating FHWA reviews.	Thank you for your comment.
BOEM-2022-0071-0257-0007	The DEIS at pages 2-10, 2-11, 2-12, 3-619 and 3-620 describes the preferred alignment for the transmission line onshore route including the longitudinal installation within the controlled access line of the Interstate I-495 (Long Island Expressway) in the South Service Road, a	Sunrise Wind was granted a NYSDOT Permit on September 15, 2023 for these construction activities.

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	trenchless perpendicular crossing beneath the LIE, and trenchless crossing of the Sunrise Highway (State Route 27). The transmission line installation requires NYSDOT review and FHWA approval prior to installation within the controlled access line of a State Highway, which includes the LIE South Service Road and perpendicular crossing beneath the LIE and Sunrise Highway.	
BOEM-2022-0071-0257-0011	Thank you for your time and consideration of NYSDOT's comments. We look forward to BOEM engaging with NYSDOT in a collaborative process for the Sunrise Wind Farm transmission line components and for future projects.	Thank you for your comment.

O.6.14. Marine Mammals

Table O-23. Responses to Comments on Marine Mammals

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BOEM-2022-0071-0013 & BOEM-2022-0071-0017	How many more dead whales? In the last few years whales stranded on the beaches of the East Coast have become common. In just the past two months there have been over a dozen. And that does not include the whales that have died in that time and sank to the bottom of the ocean. Fishermen blame industrial wind farm surveys, the wind industry blames climate change and the vessel strikes of the global supply chains of civilization will not slow down. All the while mainstream "environmental" groups have become PR people for industrial energy. That stance is mutually exclusive from their professed goal to protect wildlife like desert tortoise, sage grouse, bats and to Save The Whales. NOAA declared an official "unusual mortality event" for humpback whales in 2016, when the number of deaths on the East Coast more than doubled from the average in previous years. Coincidentally that is the same year when offshore wind development began. Which coincides with the huge jump in NOAA Incidental Harassment Authorizations. The claim that this huge jump in mortality predates offshore wind preparation activities is patently false. This strong correlation is strong evidence of causation, especially since no other possible cause has appeared. It also seems odd that	These whale mortalities are part of the Unusual Mortality Events (UMEs) for the NARW and the humpback whale. To date, there is no scientific evidence that the recent whale mortalities occurring along the east coast of the U.S. are related to offshore wind development activities. NARW mortalities in 2023 have been linked to vessel strikes and perinatal causes. Of the 90 humpback whales examined during this UME, about 40 percent had evidence of human interaction, either ship strike or entanglement. Some whales have shown evidence of pre-mortem vessel strikes; however, this finding is not consistent across all whales examined. For additional information on these UMEs, see https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events.

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	dead whales are now showing up on the west coast just as wind development is starting up there as well. If what we are seeing is what happens during the surveying process for an offshore wind farm, we can only imagine what will happen when major construction begins. If vessel strikes are a leading cause of death, why on earth would you diminish habitat and increase vessel traffic with the construction of wind turbines. Yet in the recent denial a vessel speed reduction NOAA said, it was "focused on implementing long-term, substantive vessel strike risk reduction measures". Hopefully that will include the cancelation of any further wind farm construction. We certainly should not be increasing vessel traffic at this time, we should be restricting it. Vessel strikes and ocean noise from these extra ships and their sonar mapping is killing whales. Noise interrupts the normal behavior of whales and interferes with their communication. It also reduces their ability to detect and avoid predators and human hazards, navigate, identify physical surroundings, find food, and find mates. - Such effects make it difficult for whales to avoid ships. It is one of NOAAs four Threats along with vessel strikes, fishing gear entanglements and climate change. Sound travels further and four times faster in water than in air (at a speed of almost 1,500 meters per second). The noise produced by humans can therefore spread considerable distances underwater. These sounds can	

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	be relatively constant, such as the noise produced by a ship's engine and propeller, or sudden and acute in the case of naval sonar and seismic airguns. The sound produced by a seismic airgun can cause permanent hearing loss, tissue damage and even death in nearby animals. Evidence for the lethal effects of noise can be hard to document in the open ocean. But seismic surveys have been linked to the mass mortality of squid and zooplankton. In 2017, research revealed that a single air gun caused the death rate of zooplankton to increase from 18% to 40–60% over a 1.2 kilometer stretch of the ocean off the coast of southern Tasmania. Examination of the dead whales revealed they had suffered trauma similar to decompression sickness. This was believed to have been caused by sudden changes in their deep diving behavior following exposure to sonar. The wind companies are using sonar in the geotechnical and site characterization surveys. There is also the detonation of unexploded ordnance (UXO) items from ship wrecks at this time, accidental and intentional. Noise increases animals physiological stress. Research found that a reduction in shipping following the 9/11 terrorist attacks led to a six decibel drop in noise levels in the Bay of Fundy on Canada's Atlantic coast. This coincided with lower levels of physiological stress detected in North Atlantic right whales when	

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	researchers measured stress hormones from floating whale feces. During construction of the turbines, high duty cycle impact pile driving (one strike every ~two seconds) will be used. And the pile driving is expected to occur for approximately four hours at one time for monopile installation and 6 hours per pile for piled jacket installation. This takes us to biggest threat to whales, and the ocean ecosystem that they live in, which is climate change. Climate change is caused by greenhouse gas emissions. These are created by industrial development. So climate change is a symptom of industrial development. That is the extractive industries of mining, deforestation, agriculture, factory fishing and dams which provide, through production, manufacture, transport, installation and operation, the current conveniences of a modern way of human life. Industrial development destroys ecosystems. More industrial development, by the installation of thousands of offshore wind turbines, will not solve the problem of climate change. There's one inescapable truth about the headlong rush to cover vast swaths of our countryside and oceans with 600-foot-high wind turbines: the more turbines that get built, the more wildlife will be harmed or killed. And no amount of greenwashing can change that fact. So it is distressing to see the numbers of	

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	whales washing up on our beaches. NOAA also says there is no proof that offshore wind is killing the whales. We must remember the onus isn't on whales to prove guilt, it's on industrial development to prove their innocence. The production of the materials as well as the manufacturing processes for wind turbines and associated infrastructure of the extracted energy storage and transmission are made possible by burning fossil fuels. To obtain the raw material used in wind turbines, habit is destroyed through open pit mining and mountaintop removal. These are then transported to processing plants to be turned into the component parts. It will take a tremendous amount of energy to mine the materials; transport and transform them through industrial processes like smelting; turn them into wind turbines, batteries, infrastructure, and industrial machinery; install all of the above, and do this at a sufficient scale to replace our current fossil-fuel-based industrial system. In the early stages of the process, this energy will have to come mostly from fossil fuels, since they supply about 80 percent of current global energy. Their emissions will be added to the current use emissions. After manufacture, the turbine parts need to be transported to the project location. The construction and operation of offshore wind farms increase boat traffic also leading to more greenhouse gas emissions and pollution. All of which adds to a non-existent carbon budget and thus	

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	increasing climate change. Not to mention the increased risk of marine mammal vessel strikes. All of that energy use has a carbon payback period to plan, build, maintain and decommission the processes involved in an offshore wind turbine and its required infrastructure amounting to many years. This could be up to a quarter of its' expected lifecycle. But this does not take into account the wildlife loss and habit destruction from those processes. And then in 20 years the process must be done all over again. So this is not renewable. Also there are not enough metals on the planet to produce even the first generation of a total electric energy extracting transition, even if we mine the deep sea as we are starting to do. Currently only 20% of our energy is electric. The other 80% is fossil fuel, the bulk of which is used by industry. The industrial advantage of fossil fuel is that it is stored energy that is extracted rather than an energy extracting device that requires storage and transmission infrastructure. The paradox of "renewables" is that they need unprecedented volumes of non-renewable mined materials. Increasing "renewables" means large upticks in battery metals such as copper, cobalt, lithium and nickel. Wind turbines need rare earth metals such as neodymium of which there are scarce amounts. But the work wouldn't stop there. Closed mines themselves are	

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	a huge source of devastation. If all mining stopped today there would still be an area at least the size of Austria with degrading and, in some cases, dangerous levels of heavy metals. Mining brings materials that have been locked-up in concentrations underground and lets them out into the world. Mines usually operate at depths below the water table, they need to be constantly dewatered using pumps. When a mine is abandoned, the ground water gradually re-floods underground passages and mineral seams over many months, creating acidic reservoirs of water. Above ground there are tailings ponds and piles of low-grade ore with traces of heavy metals. All of this material is exposed to oxygen and water. Exposing such elements to the elements, wreaks havoc on ecosystems, soils and water supplies through acid leaching. A mine that is abandoned can have chronic pollution for hundreds if not thousands of years. Cleaning up a mine consists of reducing water acidity, detoxifying the soil and treating waste before reintroducing flora and fauna to the site. It's a lengthy, expensive process and can cost billions for a single, large mine. Avoiding an environmental catastrophe, and cleaning all the world's mines at once, would cost hundreds of billions or even trillions. So mining the materials needed for renewable energy will increase the threats to biodiversity. These threats will surpass those avoided by “renewable” climate change mitigation.	

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	The concept of material footprints, in addition to carbon footprints, should be taken into consideration by governments. If not the planet's scarce non-renewable resources will continue to be destroyed. These factors will more than offset BOEMs calculations for climate change in their DEIS. During their operation wind turbines creates a disturbance in the air that can have far-reaching effects on the environment. The turbulence created is known to warm up the surface temperature around them. The warming can raise the temperature by up to 2°F. This will change the climate by taking away the cooling breeze. Wind turbines will change weather patterns and currents which will create more and stronger storms. Michael Moore, a senior scientist at the Woods Hole Oceanographic Institution, said whales face "a suite of risks" as turbines are built, such as increased vessel traffic and potential changes to the ecology. But that ecological change, he said, "needs significant further study to truly understand its significance." As Sunrise admits their planned construction and operations activities are not expected to "take" MORE than small numbers of marine mammals. They say incidental take long term impacts that have negative effects on large whales from the presence of turbine foundations is uncertain. For the Right Whale according to NOAA Fisheries "The potential biological removal level for the species, defined as the maximum number of	

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	animals that can be removed annually while allowing the stock to reach or maintain its optimal sustainable population level, is less than 1." This means the death of a single whale could make the difference between extinction and recovery. There is no question wind turbines kill wildlife. Humans and domestic animals account for 96% mammal biomass on the planet, only 4% is wild. Our activity has reduced the biomass of wild marine and terrestrial mammals by six times. Humanity has wiped out 60% of mammals, birds, fish and reptiles since 1970, leading the world's foremost experts to warn that the annihilation of wildlife is now an emergency that threatens all life on the planet. Prof Bob Watson, one of the world's most eminent environmental scientists and currently chair of an intergovernmental panel on biodiversity that said that the "destruction of nature is as dangerous as climate change." Said Jennifer Jacquet, a professor of environmental studies at New York University. "But we know that even in the face of a shifting climate, direct exploitation remains the largest factor affecting aquatic animals." BOEM is basing its' conclusions in the DEIS on a false analysis that offshore wind turbines will reduce climate change. They will not. It makes no sense to increase disturbance to whales when they are suffering through an unusual mortality event. Whales as a keystone species are the canary in the coal mine. As they go, so do we. That in the effort to save the climate and	

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	continuance of business as usual, we are destroying the environment. If you continue with this offshore wind project, it will be humans that experience an unusual mortality event.	
BOEM-2022-0071-0229-0012	We also agree with all NMFS' other concerns regarding lack of BOEM EFH analysis/regulatory compliance detailed in their October 7, 2022 letter, and incorporate them here by reference. We particularly note this regarding UXO detonation/deflagration concerns. Recently, an unplanned UXO detonation occurred in the UK, while a UXO disposal expert attempted to slow burn/deflagrate a UXO. Therefore, all analysis must include, and even expect, worst case scenarios regarding UXO removal analysis, as even the best attempts at slow burn deflagration can result in major unplanned detonations. These impacts would also apply to the Marine Mammal section, particularly regarding the critically endangered North Atlantic Right Whale. We also incorporate by reference here all NMFS concerns regarding EFH that were submitted to BOEM regarding South Fork Wind Farm, which we have attached with this comment letter, as the South Fork project is adjacent to the proposed Sunrise Wind Project and would create similar adverse effects. Adequate UXO analysis seems to be absent both project documents, as they were from the Revolution and Vineyard Wind documents, as we discussed in our comments on the Revolution Wind DEIS which we also incorporate here by reference.	Analysis is included in Section 3.11.5.1.2. The model used assumes UXO detonation without slow burn deflagration, but with a required 10 dB of broadband attenuation.

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BOEM-2022-0071-0232-0031	Although offshore wind companies may not use the traditional airguns to collect their high-resolution geophysical maps of the seabed, they do employ high voltage, boomers (3000 V), sparkers (20-200Hz), and multi-beam echo sounders, side scan sonars (100- 500 kHz), shallow and mid penetration sub-bottom profilers, ultra short baseline positioning equipment, and marine magnetometers. These mid-frequency seismic ranges can cause rectified diffusion. Rectified diffusion can initiate decompression sickness in marine mammals independent of any effect on the behavior of the animals. Decompression sickness, can disorient, cause hearing loss, unconsciousness, and death. Moreover, any of these symptoms can then increase a marine mammal's risk of ship strikes. Neither BOEM nor NOAA adequately addresses this issue. An absence of evidence does not mean evidence of absence. The current rate of whale deaths suggests the development has violated the MMPA and the ESA.	Boomers and sparkers may be used, but with a maximum source level (at 1 m) of 211 dB (peak). The proposed equipment produces source levels that are orders of magnitude lower energy than air guns, boomers, and sparkers that have source levels up to 247 dBpk. At the energy levels proposed to be used for this Project, the risk of rectified diffusion is less than 1 m from the sound source, and therefore is extremely unlikely to occur. A table of expected equipment has been added to the document.
BOEM-2022-0071-0232-0033	The US has designated the area planned for construction as a critical habitat for the North Atlantic Right Whale (NARW). With only 349 members alive today, the NARW faces extinction. The unusual mortality event (UME) that began in 2017 has affected 20% of the population. Deaths outpace births. Pre-construction seismic surveys and impact drilling within whale habitats coincided with the onset of their UME and the most recent NARW death today (02/14/2023) substantiates this association. BOEM and NOAA have a legal obligation to protect and promote the recovery of this species under the ESA and	BOEM and all federal action agencies are required to use the best available scientific information. The best available information indicates that the UME is not related to seismic surveys for offshore wind farms. Additionally, the equipment that will be used in mapping does not include air guns, and sparkers or boomers are anticipated to operate at a maximum of 211 dB peak. A table has been added to the document describing the anticipated equipment and source levels. None of the included survey is expected to pose a risk of non-auditory or auditory injury with the included monitoring

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	the MMPA. Absence of Evidence is NOT evidence of absence. Seismic surveys are associated with whale morbidity and mortality (Engel, 2004). As evidenced by the most recent death, BOEM's monitoring mitigation strategies cannot ensure the safety of the species. Because whales sequester carbon, the loss of a single whale, let alone an entire whale species, will increase the carbon footprint of this project (Chami, 2019). Offshore wind farms (OWFs) will inevitably drive threatened whale species closer to extinction (Seals, 2017). The BOEM DEIS violates the MMPA and the ESA.	and mitigation measures.
BOEM-2022-0071-0242-0005	Extend the time period of the proposed seasonal restriction from December 1 through April 30;	Shutdowns are proposed during the months identified in the acoustic modeling report. No UXO/MEC detonations would occur between December and April, and mitigation zones 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). Please see Appendix H for more details on mitigation measures and Terms and Conditions from the NMFS Biological Opinion Issued September 28, 2023.
BOEM-2022-0071-0242-0020	According to the DEIS, of the 40 marine mammal species with occurrence records off the northeastern coast of the U.S., 16 species are expected to occur in the proposed Project Area. Four species of large whale are listed as endangered under the ESA and as strategic stocks under the MMPA: North Atlantic right whale (or right whale), fin whale, sei whale, and sperm whale. Additional species include two mysticetes (humpback whale and common minke whale), two pinnipeds (gray	Thank you for your comment. The abundance estimates for marine mammals have been updated based on Duke University's Habitat-based Marine Mammal Density Models for the U.S. Atlantic. These models were updated in June 2022 and include survey effort data collected between 1992-2020 and the version 12 model the NARW. See Table 3.11-2 Abundance Estimates of Marine Mammals Expected to Occur in the Proposed Project Area.

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	and harbor seal), and eight odontocetes, including the Western North Atlantic Northern Migratory Coastal stock of common bottlenose dolphins which is considered a strategic stock under the MMPA. Right whales, humpback whales, and minke whales are currently experiencing elevated levels of mortality and injury that have been designated by the National Marine Fisheries Service (NMFS) as unusual mortality events (UME). Expected marine mammal occurrence in the Sunrise Wind Project Area and broader region as analyzed in the DEIS is based on known habitat associations, habitat modeling, confirmed sightings, and acoustic detections. As such, the data and information referenced in the DEIS is relatively comprehensive; however, there are some more up-to-date data sources that should be considered:	
BOEM-2022-0071-0242-0021	Abundance and Density Estimates: The Roberts et al. models have recently been updated as of 2022, and BOEM should include these data before the Final EIS is published to fully assess risk and impacts to species in the Project Area.	Updates were made based on the most recent available estimates.
BOEM-2022-0071-0242-0022	Additional Data Sources for North Atlantic Right Whales: To better characterize North Atlantic right whale occurrence and habitat use, BOEM should consider all available data sources, including photo-identification data, stranding data, the location of Dynamic Management Areas (DMAs) declared by NMFS pursuant to ship strike rule, and prey data.	Summary background is provided in Section 3.11.1, including occurrence and habitat use in the Project Area and nearby regions.

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BOEM-2022-0071-0242-0024	In addition to the now outdated abundance estimate for North Atlantic right whales from the 2021 Stock Assessment Report (n=368), we were encouraged to see the DEIS included the updated abundance estimate for North Atlantic right whales released in the North Atlantic Right Whale Consortium's (NARWC) annual Report Cards, considered best available scientific information on the species. We note that the NARWC recently revised its 2021 population estimate to 340 individuals. BOEM should include this updated estimate in the DEIS and, critically, carry it forward to the impact analysis.	Updates were made based on the most recent available estimates.
BOEM-2022-0071-0242-0025	We are concerned with the overall conclusion of BOEM's impact analysis for the Proposed Action for marine mammals. Due largely to the adverse impacts that may result from pile driving and vessel strike, "BOEM expects the overall impact on marine mammals from the Proposed Action to be moderate as the overall impacts on individuals and/or their habitat could have population-level effects, but the population can significantly recover from impacts or enough habitat is still functional to maintain the viability of the species both locally and throughout the range." This conclusion underestimates risk to North Atlantic right whales from vessel strike. A single North Atlantic right whale cannot be killed or seriously injured by a vessel strike, or any other human activity, in any given year if the species is to survive. BOEM defines major impacts as "detectable and	BOEM believes the included monitoring and mitigation measures for vessel traffic will be sufficient to avoid risk of vessel strike to NARW. BOEM is currently engaged in Section 7 consultation with NMFS. Through this process, we anticipate that any final monitoring and mitigation measures finalized during that process will be sufficient to avoid impacts to NARW in accordance with the requirements of the Endangered Species Act.

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	measurable," "of severe intensity," and "can be long lasting or permanent." Further, major impacts "to individuals and/or their habitat would have severe population-level effects and compromise the viability of the species." Based on this definition, vessel strike clearly represents a major impact for North Atlantic right whales. BOEM should capture this distinction for this critically endangered species in its impact analysis, as it has done so previously; this will help ensure that appropriate avoidance, minimization, and mitigation measures are developed and required to address the outsized risk posed to North Atlantic right whales. BOEM also concludes that the Proposed Action may potentially include minor beneficial impacts from an increase in prey availability. We remind BOEM that there is little to no literature currently available to support the assumption that offshore wind development will provide tangible benefit to marine mammals. In fact, recent scientific information suggestions that hydrographic changes induced by the turbines may affect marine mammal prey in a variety of ways, many of which are still to be determined. Due to a lack of evidence and significant uncertainties, BOEM should not include an assumption of increased prey availability as a benefit as part of its overall conclusion on the impacts of the Proposed Action.	
BOEM-2022-0071-0242-0028	Within the DEIS, BOEM asserts that pile-driving activities will likely exceed permanent threshold shifts (PTS) and	Currently, sound energy is considered to accumulate whenever individuals are exposed to noise greater than

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	temporary threshold shifts (TTS) for all marine mammal functional hearing groups. We note that behavioral impacts resulting from noise exposure can be significant and the best available scientific information on this matter is not incorporated into the DEIS. For example, BOEM states: "The potential for these stressors to have population-level on sequences likely varies by species, among individuals, across situational contexts, and by geographic and temporal scales (Southall et al. 2021)," but does not provide further analysis of what is known. There are data available beyond the Southall et al. (2021) risk assessment that BOEM should consider. For example, scientific information on North Atlantic right whale functional ecology shows that the species employs a "high-drag" foraging strategy that enables them to selectively target high-density prey patches but is energetically expensive. Thus if access to prey is limited in any way, the ability of the whale to offset its energy expenditure during foraging is jeopardized. In fact, researchers have concluded: "right whales acquire their energy in a relatively short period of intense foraging; even moderate changes in their feeding behavior or prey energy density are likely to negatively impact their yearly energy budgets and therefore reduce fitness substantially." North Atlantic right whales are already experiencing significant food stress: juveniles, adults and lactating females have significantly poorer body condition relative to southern right whales and the poor condition of lactating females may cause a reduction in calf growth. A recent study confirmed that	150 dB sel. When the number of impact events goes over a certain number, the area of potential PTS becomes larger than the area of behavioral disturbance (based on the 160 dB rms threshold). This results in PTS areas are equal to or larger than behavioral disturbance. Because of this, shutdown zones are protective against both PTS and behavioral impacts.

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	larger females do, indeed, have more calves. These studies provide an indication of the significant impact disturbance during foraging may have on a marine mammal species. The waters off southern New England are a critically important foraging area for North Atlantic right whales; for this Final EIS, and other DEISs that are forthcoming, BOEM must fully assess the impacts associated with disturbance of North Atlantic right whales and other marine mammal species during foraging, at the spatial and temporal scale those impacts are expected to occur, for individual projects and cumulatively across projects. As the energetic requirements of many marine mammal species are not yet known, we recommend BOEM proceed with this analysis in a precautionary manner, and support research aimed at addressing these knowledge gaps.	
BOEM-2022-0071-0242-0030	BOEM must use the best available scientific information on marine mammal presence and density, as required by NEPA, when considering seasonal restrictions to protect North Atlantic right whales and measures designed to minimize impacts to other marine mammal stocks in the Sunrise Wind Project Area. BOEM proposes a four-month seasonal restriction on impact pile driving from January 1 through April 30 to minimize impacts to North Atlantic right whales. However, these dates do not reflect the best available scientific information for the Project Area and broader region where right whales are often detected outside of this time period. Since 2010, the distribution and habitat use of North Atlantic right whales and other large whale species off	BOEM uses the best available scientific information and has made recommendations based on this data.

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	the U.S. East Coast has shifted in response to climate change-driven shifts in prey availability. Best available scientific data indicates that North Atlantic right whales now rely heavily on the waters within, and in the vicinity of, the Sunrise Wind Project Area year-round, and that this area is increasing in habitat importance for the species. A recent scientific study led by the New England Aquarium analyzed data collected during systematic aerial surveys conducted within the offshore wind energy development area off Southern New England, as well as from across the broader region. The resulting multi-year data set enabled a comparison between two different time periods (2013-2015 and 2017-2019) to assess trends in abundance of right whales in the region in the winter and spring. The study confirmed a growing understanding that the number of right whales using habitat off Southern New England—known to be a historic whaling ground—in the winter and spring significantly increased between 2013 and 2019. Right whales were also detected during every season surveyed from 2017 to 2019. Confirmed year-round detection is unique among major right whale habitats. During these surveys, right whales were also observed feeding and socializing in groups. The authors conclude that their results, when interpreted alongside previous studies, "suggest that [Southern New England] represents an increasingly important habitat for the declining right whale population."	

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BOEM-2022-0071-0242-0031	Scientific analysis comparing the Northeast Large Pelagic Survey Collaborative (NLPSC) aerial survey campaigns conducted in 2011-2015 with those conducted in 2017-2019 also show that right whales have been sighted in nearly every month since 2017, with peak sighting rates between late winter and spring. Modeling suggests that 23 percent of the population is present from December through May each year, and that mean residence time has tripled to an average of 13 days during these months. A total of 327 unique right whales were identified during the combined survey effort off Southern New England between March 2011 and December 2019; by the end of 2019, 87 percent of the then living population had been sighted. All demographic classes of right whales have been documented in or near the Project Area and the age ratio of the whales using the area is reflective of the species. Both reproductive females and conceptive females have been seen in the study area. Forty-five of the 108 reproductively active females (42 percent) known to be alive during the study were sighted in the Southern New England region, and 17 were resighted in multiple years. The area also provides important habitat for cow-calf pairs. Six different calves (inferred by the presence of known mothers) were recorded during the study in southern New England (4 in 2011, 1 in 2015, 1 in 2019; 89 calves were born in the population during this time). Three calves were sighted twice in the same year.	Thank you for your comment, a summary of this background information can be found in the NARW section of Section 3.11.1, *Marine Mammals, Description of the Affected Environment and Future Baseline Conditions*.

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	The Project Area is situated within important habitat for socializing and feeding right whales and protection of animals while foraging and mating is essential to the survival of the species. Foraging areas with suitable prey density are limited relative to the overall distribution of North Atlantic right whales, and a decreasing amount of habitat is available for resting, pregnant, and lactating females. This means that unrestricted and undisturbed access to suitable areas, when they exist, is extremely important for the species to maintain its energy budget. As noted above in Section II.B.3, scientific information on North Atlantic right whale functional ecology also shows that the species employs a "high-drag" foraging strategy that enables them to selectively target high-density prey patches, but is energetically expensive. Thus, if access to prey is limited in any way, the ability of the whale to offset its energy expenditure during foraging is jeopardized." Undisturbed access to foraging habitat is necessary to adequately protect the species, as is the minimization of disturbance during the species' energetically expensive migration. Feeding behaviors have been observed in and close to the Sunrise Wind Project Area by virtually all whale species and small cetaceans regularly occurring in this area. Oceanographic studies in the area, which were part of the NLPSC campaigns, confirmed the presence of a zooplankton community composition similar to that of Cape Cod Bay, which is a known hotspot for right whale feeding. A feeding Biologically Important Area (BIA) for	

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	fin whales is designated March to October east of Montauk Point and feeding humpback whales are regularly observed, particularly during March and April. Courtship behaviors in the area have also been observed by humpback whales.	
BOEM-2022-0071-0242-0033	Following the mitigation hierarchy, we believe BOEM should prioritize impact avoidance and consider alternatives that use quiet foundation technologies that avoid pile driving noise entirely and significantly reduce noise impacts to marine mammals and other marine life overall. As we noted previously in these comments and in our past comments on other projects, BOEM and the developer should provide more detailed analysis to support the elimination of these technologies from consideration. Quiet foundation types can afford developers significant flexibility in the construction schedule, including potentially year-round and 24-hour construction in some areas. In our view, these incentives should be fully explored by BOEM and industry. Noise impacts pose a serious risk to many marine mammal species, and this risk is exacerbated by the developer's intention to initiate pile driving of monopile foundations–the most noise intensive technological option–after dark if deemed necessary "to meet schedule requirements." Rather than this being a rare exception, however, further scrutiny of the DEIS indicates that initiating pile driving after dark will likely be the norm. It is hard to see, for example, how the developer will install up to three or four piles per day, as	Thank you for your comment. As discussed in Section 2.2 Alternatives Considered but Not Analyzed in Detail, BOEM considered a range of alternatives during the EIS development process that emerged from scoping, interagency coordination, government-to-government consultation, and internal BOEM deliberations. The use of alternative foundation types, including suction bucket foundations and floating wind turbine foundation types to reduce impacts on marine mammals, sea turtles, and fish from pile driving associated with monopile and jacket foundations, are not feasible within the Lease Area. Rationale for eliminating these alternatives can be found in Table 2.2-1 of the Final EIS. "Quiet" foundation design types like the monopod suction caisson, suction caisson jacket, and gravity base structure foundations were evaluated during Project development. These options were eliminated in favor of the monopile foundation due to their larger footprints (leading to more extensive seabed and navigation impacts), unsuitability for site-specific conditions, and supply chain issues. Regarding nighttime pile driving, NMFS' ITA would require sufficient demonstration of the effectiveness of proposed monitoring and mitigation protocols in the form of an Alternative Monitoring Plan prior to initiating any nighttime pile driving.

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	indicated by the project design envelope and chosen modeling scenarios for the acoustic impact analysis without operating under the assumption of a 24-hour pile driving window unless additional concurrent construction vessels are planned to be in operation.	
BOEM-2022-0071-0242-0035	BOEM states that it would require Sunrise Wind to submit a nighttime pile driving monitoring plan for review and approval by BOEM and NOAA Fisheries six months prior to initiating impact pile driving activities. The purpose of the plan is to demonstrate that Sunrise Wind can meet the visual monitoring criteria for the Level A harassment zone(s)/mitigation and monitoring zones plus an agreed upon buffer zone (these combined zones are referred to henceforth as the nighttime clearance and shutdown zones) with the technologies Sunrise Wind is proposing to use for monitoring during nighttime impact pile driving. We are supportive of this approach only if initiation of impact pile driving at night is prohibited unless the plan is approved, and only if the technologies and methodologies proposed are independently and scientifically proven (i.e., via peer-reviewed scientific study) to have detection rates that are equally or more effective than can be achieved by monitoring during daylight hours with good visibility conditions. Additionally, the description of the Nighttime Pile Driving Monitoring Plan requires further clarification. The DEIS states "[i]f, during nighttime pile driving, undetected animals are found in the clearance and/or	Nighttime pile driving mitigation and the Nighttime Pile Driving Monitoring Plan are discussed in Appendix H. BOEM and NMFS will work together to develop the plan to meet the appropriate criteria. Below are some technologies and methodologies that would be used to achieve these goals. However, please see Appendix H for more details on nighttime pile driving mitigation and monitoring. • 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 night vision device (NVD) and one monitoring the infrared (IR) thermal imaging camera system. 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

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	shutdown zones, nighttime impact pile-driving activities would cease as soon as possible in consideration of human safety, and NMFS, BOEM, and BSEE [Bureau of Safety and Environmental Enforcement] would be notified immediately." It is unclear what BOEM means by finding undetected animals given that undetected animals are, by their nature, not detected. Clarification is also needed to understand how restart approval will be coordinated between NMFS, BOEM, and BSEE. The practicality of this plan is questionable at this time.	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 night-vision devices; 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).
BOEM-2022-0071-0242-0039	Additionally, a wealth of research exists which details the impacts of continuous noise on marine life, and the importance of reducing this impact. Best available scientific information indicates that, during the operation phase, offshore wind turbines may generate noise audible and potentially impactful to large whales and other marine species over significant distances. Understanding levels and impacts of operational noise is an immediate research and monitoring priority as the first offshore wind projects are constructed in the United States. Pending further study, we recommend the use of direct drive turbines as opposed to turbines with a gear box. Direct drive turbines may emit lower noise levels and reduce risk of behavioral disturbance or habitat displacement of North Atlantic right whales and other marine mammal species, and also reduce impacts to key marine mammal prey species, during the operation phase of development.	Thank you for your comment. This Project complies with the recommended action as it will only use direct drive turbines. However, even considering the potential use of geared turbines as described in Madsen et al. (2006), underwater noise would be expected to attenuate to the 120 dB threshold for behavioral disturbance established by NMFS within 390 ft (119 m) of an operating turbine.

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BOEM-2022-0071-0242-0040	We have repeatedly stressed to the agency our profound concerns regarding the recent informal consultation for marine site characterization activities for offshore wind energy development off the U.S. Atlantic Coast and its failure to rely on the best available scientific data, particularly with respect to the critically endangered North Atlantic right whale. In a letter submitted to BOEM and NMFS on January 20, 2022, a number of our organizations urged both agencies to immediately reinitiate consultation under the ESA based on the best available scientific data and new North Atlantic right whale population number to ensure the mitigation measures on which BOEM is relying for site characterization and assessment activities are protective enough to reduce risk to right whales. BOEM must update the analyses now in order to comply with the ESA on this and all future Atlantic coast leases. In the interim while consultation is ongoing, our groups reinforce the importance of incorporating clear, strong environmental measures directly into the NEPA documents and lease stipulations for existing projects on a project-by-project basis. In particular, based on the significant information we are already aware of and have presented in this and other letters, we urge the agency to incorporate the mitigation measures found in Attachment 1 into upcoming environmental analyses and lease terms.	We thank you for your comment, but respectfully disagree. BOEM in consultation with NMFS used the best available science to produce the Programmatic Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (BOEM 2021). Within that document, there are mitigation measures and BMPs in place for use of high resolution geophysical survey equipment to mitigate impacts on ESA-listed species including the NARW.
BOEM-2022-0071-0248-0022	Regarding potential impacts to the critically endangered North Atlantic Right Whale, in a letter from NOAA's Chief of Protected Species to BOEM found that	Currently, sound energy is considered to accumulate whenever individuals are exposed to noise greater than 150 dB sel. When impact events go over a certain

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	"disturbance to right whale foraging could have population-level effects on an already endangered and stressed species. https://newbedfordlight.org/wp-content/uploads/2022/11/UR1-2023-000009_10_17_2022.pdf	number, the area of potential PTS becomes larger than the area of behavioral disturbance (based on the 160 dB rms threshold). This results in PTS areas that are equal to or larger than behavioral disturbance. Because of this, shutdown zones are protective against both PTS and behavioral impacts.
BOEM-2022-0071-0248-0023	In addition to potential impacts to the NARW, a concerning number of whale mortalities have been occurring the last couple of months. As of January 16, at least 8 whales have washed up on beaches along the Atlantic coast in areas where offshore wind survey operations have been taking place. This has caused one legislator to "demand that all offshore wind activity be halted until it is properly determined what the effects of these activities are having on our marine life.	These whale mortalities are part of the Unusual Mortality Events (UMEs) for the NARW and the humpback whale. To date, no scientific evidence suggests the recent whale mortalities occurring along the U.S. east coast are related to offshore wind development activities. NARW mortalities in 2023 have been linked to vessel strikes and perinatal causes. Of the 90 humpback whales examined during this UME, about 40 percent had evidence of human interaction, either ship strike or entanglement. A portion of the whales have shown evidence of pre-mortem vessel strike; however, this finding is not consistent across all whales examined. For additional information on these UMEs, see https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events.
BOEM-2022-0071-0282-0013	Carl Van Warmerdam. It' s C- A- R- L, V- A- N, W- A- R- M- E- R- D- A- M. So, I' m going to start with some house cleaning to specifically address, the DEIS. And that's one glaring omission. And I'm glad that you had the -- about 50 pages on the endangered sea turtle, but almost nothing on the North Atlantic right whale. And I'm here as an advocate for the North Atlantic right whale. So, the only -- there' s pretty much only one paragraph in there, and that' s Section 3.5.6.6.5, the impacts of alternative C	NARWs are considered specifically throughout the evaluation of the IPFs where appropriate. The EIS is broken out by species groups, functional groups, or functional elements, and the EIS does not contain sections for individual species. Because NARWs are listed as endangered, the potential impacts associated with this Project are considered with a high level of detail during the ESA Section 7 process. For the No Action Alternative, we are required to consider the

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	1 on endangered species, listed species. And pretty much all it says, I can -- it' s going to take a while to read it. Impacts on ESA- listed marine mammals are not expected to be different than the non- ESA- listed marine mammals, the primary source of potential impacts for ESA- listed marine mammals include increased sound level from pile installation activities and GG surveys, project- related vessel traffic and alteration of prey availability based on it. Information contained in this document, BOEM anticipates that alternative C 1 for the Sunrise Wind farm project would likely adversely affect, but not jeopardize, the continued existence of the North Atlantic right, the sea fin or sperm whales. Now that' s pretty ominous right there. I don' t have to tell you that they are critically endangered and the history that of only 350 individuals. But that's all you have on there. So, that needs to be changed. There needs to be 50 pages on the North Atlantic right whale and everything covered on that. Now, there's even no mention in here of the joint BOEM and NOAA strategy for the North Atlantic right whale. That should also be in there. So, it's just beyond me here because you have alternatives -- alternative C-1, which is a fishery habitat impact minimization. So that by definition means that alternative B is going to impact the habitat. Now, the turtles -- endangered turtles, they come into this area, but they don' t live there. The North Atlantic right whale, this is their home, their only home. So, when you	effects of ongoing activities and other future actions considered likely to occur. This is why ongoing and likely future actions are described along with their potential impacts on marine mammals. The No Action Alternative does not simply consider the difference between executing the Proposed Action and not executing it, it considers the baseline effects of existing conditions and activities. The alternatives have the same impact level determinations as the Proposed Action for marine mammals. This can occur even when the alternatives result in fewer individuals exposed to Project impacts because impact level determinations are based on the description of each of the impact levels, which is included at the beginning of the marine mammal section.

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	combine all of those into simply the marine mammals and you're putting in what each of these actions entail, and it' s all the same. Each alternative is negligible to moderate or minor benefit. And that's with no action. Now, how can that be? If there' s no action, nothing's going to happen. So, I mean, you can put your other claims for climate change in there, but this is going to kill the whale certainly. So, you know killing the whale to save them isn't working. So, I don't understand how environmental groups, conservation groups can call themselves that they're -- it' s no longer about save the whales, it' s about they've become advocates for an industrial development. So that' s what they' re promoting now. And I just don' t understand it. I believe that those groups should be and we should save the whales. Thank you.	

O.6.15. Navigation and Vessel Traffic

Table O-24. Responses to Comments on Navigation and Vessel Traffic

Comment No.	Comment	Response
BOEM-2022-0071-0031	Dear Ms. Stromberg, The American Waterways Operators (AWO) is the tugboat, towboat and barge industry's advocate, resource, and united voice for safe, sustainable, and efficient transportation on America's waterways, oceans, and coasts. Our industry is the largest segment of the nation's 40,000-vessel domestic maritime fleet and moves 665 million tons of cargo each year safely and efficiently. On behalf of AWO's more than 300 member companies, we appreciate the opportunity to comment on the Sunrise Wind Farm Project Draft Environmental Impact Statement. AWO members lead the maritime industry in safety, security, and environmental stewardship. We are committed to working with federal and state agencies to advance these shared objectives. Our commitment to sustainability includes strong support for the development of alternative energy resources. However, it is critical that such projects not produce navigational hazards that put vessels and their crews at risk or obstruct the movement of commodities on which the nation's economy depends. It is with these concerns in mind that we have worked closely with the Bureau of Ocean Energy Management and the U.S. Coast Guard on previous requests for comment on wind energy development areas. Although the Sunrise Wind Farm does not appear to	Thank you for expressing your concerns. SRWF is expected to coordinate with the maritime community and USCG to avoid laying export cables through any traditional or designated lightering/anchorage areas, meaning that any risk for deep-draft vessels would come from anchoring in an emergency scenario. In addition, the cable and other Project features would be appropriately plotted on nautical charts. For the Sunrise Wind Project, cables would typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m). However, the target burial depth in specific areas along the cable routes would be determined based on an assessment of seafloor conditions, seabed mobility, and the risk of interaction with external hazards such as fishing gear and vessel anchors, which would be determined through a Cable Burial Risk Assessment if the COP is approved. This text was added to the Final EIS in Appendix Q, Section 3.19, *Navigation and Vessel Traffic*, for more clarity.

Comment No.	Comment	Response
	conflict with traditional towing vessel navigation routes, we remain concerned that the cabling for the proposed project would only be buried 3 to 7 feet deep. As we noted in our previous comments, if a vessel must lower an anchor during an emergency situation, vessel operators must be sure that they will not inadvertently strike an underwater cable, which could be dangerous to mariners and the environment. Cables from this project should be buried at least 15 feet deep to ensure that they are neither struck nor snared during an emergency anchoring operation. This is a best practice that is being followed in other wind projects and Sunrise Wind should follow the same parameters here to minimize the risk of damaging the cables and threatening mariner safety and the environment. Thank you again for the opportunity to comment. I would be pleased to provide additional comments or further information as you see fit.	
BOEM-2022-0071-0229-0020	BOEM's analysis of navigational impacts for commercial fisheries and associated conclusions are insulting and incomplete. The DEIS states that "BOEM expects the industry to adopt both technological and non-technology-based measures to reduce impacts on marine radar, including greater use of AIS and electronic charting systems, new technologies like LiDAR, employing more watchstanders, and simply avoiding wind farms altogether (National Academies of Science, Technology, and Engineering 2021)." BOEM then footnotes the term "watchstanders" as if we would not know what that is, meanwhile using technical terms	Your comment has been addressed in Sections 3.19.5.5, 3.19.6.3, 3.19.7.4, and 3.19.8.4 under *Navigation and Vessel Traffic*.

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	everywhere else in the document. Simply employing more watchstanders will not solve a radar interference problem. Additionally, the costs of employing additional watchstanders simply to account for the navigational dangers caused by the proposed Project's marine radar interference would be "economically unfeasible" for our vessels, to quote rationale from other sections of the document as regards economic infeasibility of various Alternatives. Even should BOEM require the developer to pay for such costs as part of mitigation, it would still not solve the issue. The commercial fishing industry already uses AIS. AIS will not help when not every turbine will be marked with AIS and the turbines/turbine blades themselves cause false reflections, sidelobes, and other interference. BOEM may not understand how AIS works; we do. AIS is not the panacea for all radar interference problems. Not all vessels- including recreational and commercial vessels- have AIS. Radar interference will make it difficult to impossible to see such vessels. Furthermore, not even every turbine would be equipped with AIS, and per the developer's COP only "select WTGs" will be equipped with AIS, of which BOEM is well aware. LiDAR is used primarily for high resolution mapping and is not a current replacement for marine vessel radar. In fact, BOEM's own study conducted via the National Academies of Science states regarding LiDAR, "Regarding the feasibility of integrating these technologies into MVR	

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	systems, the effective range of these systems is generally much shorter than MVR, especially in adverse weather and in the presence of smoke and other aerosols, and so their use in the marine environment requires careful evaluation and integration with other systems." BOEM has this information, knows that LiDAR is not a currently viable solution but instead an untested hypothesis which may be an ineffective replacement for marine vessel radar particularly in inclement weather when radar is most necessary, but blithely states that "don't worry; the fishing community can use this device which will make navigation just fine". This is gross negligence on the part of BOEM and both the agency's lack of analysis, deliberate ignorance of its own data, and associated DEIS conclusions are damning.	
BOEM-2022-0071-0229-0021	BOEM apparently also does not know how electronic chart systems work, nor that every commercial fishing vessel is already equipped with and utilizes electronic charts for navigation. Again, these will not solve radar interference. In fact, the USCG has discontinued issuance of paper charts and has moved exclusively to electronic charts. Therefore, all navigation will per regulation be conducted according to electronic charts anyway. Perhaps BOEM is unaware of this fact, as it is apparent that the agency has not done any analysis on navigation despite an OSCLA requirement that the agency "shall ensure" safety of navigation when conducting all wind farm related activities, which would especially include DEIS analysis. Regardless, electronic charts do not solve radar interference. That is not how	Your comment has been addressed in Sections 3.19.5.5, 3.19.6.3, 3.19.7.4, and 3.19.8.4 under *Navigation and Vessel Traffic*.

Comment No.	Comment	Response
	marine navigation works. The fact that BOEM has relegated this discussion to essentially one paragraph of discussion in the DEIS is mind boggling. Clearly, BOEM has no intention of analyzing this very real and present danger to the commercial fishing industry as the result of its ongoing actions, despite information that would dictate otherwise. As the National Academies of Science study that BOEM references as suggesting that the solution will be "simply avoiding wind farms altogether"- as was also noted in BOEM's Vineyard Wind Record of Decision47- is the only feasible solution listed, BOEM must then adjust its conclusions. This is the only feasible conclusion that BOEM has presented in its DEIS analysis of navigational impacts on the commercial fishing industry. Notably, the National Academies study did not present any immediate solutions to marine vessel radar interference, merely confirmed the issue, highlighted various problems, and suggested areas for further study. As such, no solution currently exists. BOEM must integrate this data and these conclusions into its DEIS analysis, particularly as per its requirement that the Secretary "shall ensure" both "safety" and "prevention of interference with reasonable uses" per OSCLA. Radar interference counts as interference. If navigation is unsafe, and avoidance of wind farms is the only logical solution, then BOEM cannot claim that operations in the proposed Project area will be safe or feasible.	

Comment No.	Comment	Response
BOEM-2022-0071-0229-0022	As the MARIPARS study that BOEM continues to rely on for its navigational impacts analysis did not consider radar interference, and has since in that respect been superseded by the National Academies study, BOEM must completely update all its DEIS analysis regarding navigational impacts. Without such, and without realistic, data-based conclusions, BOEM's DEIS is negligent, faulty at best. Therefore we request that BOEM consult with the USCG to initiate an updated MARIPARS that analyzes radar interference as it pertains to the MA/RI and MA WEAs, its impacts on navigational safety, particularly as pertains to operations in inclement weather and USCG vessel capabilities for search and rescue as impaired by radar interference for its own vessels, including a full modeling study similar to that conducted for Cape Wind which utilizes the size and number of turbines planned or expected for the MA/RI and MA WEAs, including all findings of the National Academies of Science study which noted that size and number of turbines is a significant contributing factor to interference analysis. We also request that BOEM address the factual errors discussed above related to additional watchstanders, LiDAR, AIS, and electronic charts, as none will mitigate or fix the radar interference problem. BOEM already knows the deficiencies of LiDAR and AIS as contained in its own documents discussed above. We also request that BOEM update its conclusions on navigational safety and commercial fishing impacts accordingly.	Your comment has been addressed in sections 3.19.5.5, 3.19.6.3, 3.19.7.4, and 3.19.8.4 under *Navigation and Vessel Traffic*. The USCG is a cooperating agency and therefore has reviewed the Draft EIS, as well as participated in agency meetings with BOEM.

Comment No.	Comment	Response
BOEM-2022-0071-0248-0006	In past comment letters, we pointed to how the announcement of additional areas in the New York Bight and Central Atlantic have consequences with existing leased projects, which spoke to the need for a cumulative approach. For example, designation of the Hudson North WEA impacted RODA's collaboration with Equinor. Based on direct feedback from the fishing industry in the region, Equinor adjusted its layout design for EW 1 to reduce impacts to fishing. Unfortunately, the discussions about nuanced spacing and transit accommodations for Empire Wind were acknowledged to be greatly affected by what ultimately occurs in the Hudson North WEA, which abuts the southeastern edge of the lease. This heavily transited and fished area is now slated to become a larger contiguous developed area, further displacing existing users. Due to the many leases and expansive nature of this new infrastructure, every aspect—from biological, ecological, and physical to navigational and access-related—must be looked at in a cumulative manner.	Thank you for your comment. The Project has assessed cumulative impacts.
BOEM-2022-0071-0251-0004	Without an appropriate transit lanes through Sunrise Wind, such as the four nautical mile transit lanes that were requested during the MARIPARS, commercial fishermen will be forced into dangerous situations and lose time, fuel, and product since they will be forced to travel around the lease areas because of radar interference. These losses must be evaluated by time and economics for New York fishermen by BOEM.	Navigation within and around the SRWF is discussed in Sections 3.19.5.5, 3.19.6.3, 3.19.7.4, and 3.19.8.4 under *Navigation and Vessel Traffic*.

O.6.16. Other Uses

Table O-25. Responses to Comments on Other Uses

Comment No.	Comment	Response
BOEM-2022-0071-0232-0030	As stated previously, BOEM must also consider the global impacts. Unfortunately, wind turbines require the mining of rare earth metals (Lanthanides, Neodymium, praseodymium, dysprosium and to some extent terbium). Mining these elements contaminates the water table, generates radioactive waste, risks harmful exposures, and generates CO2 emissions (Ives, 2013). The new push for offshore turbines has increased the demand for rare earth metals. The pressure for more supply may require ocean floor mining, which will incur another stress on the ocean and on global warming by resuspending carbon previously sequestered in marine sediments, heavy metal contamination of marine food webs, and biodiversity loss. Increasing demand for rare earth metals could have a profound effect on public health (Hamley, 2022). BOEM needs to consider the environmental costs of mining rare earth metals in the overall assessment of the project's environmental impacts.	The EIS assesses the potential environmental, social, economic, historic, and cultural impacts that could result from the construction, operation, maintenance, and eventual decommissioning of the Sunrise Wind Project proposed by Sunrise Wind in its COP. The EIS will inform BOEM in deciding whether to approve, approve with modifications, or disapprove the COP. The Final EIS is not a final decision document, but rather considers the potential impacts that could result from the Proposed Action. In the proposed Project, Sunrise Wind is not proposing actions related to mining to gather the materials needed for wind turbines. The potential environmental impacts related to mining rare earth metals is considered in other processes and in proposals related to that occurring. This is not a part of the Proposed Action by the Applicant, and therefore, is not described in this EIS.
BOEM-2022-0071-0248-0037	A finding of major impacts to scientific research and surveys (Sunrise DEIS p. ES-xii, CVOW DEIS p. S-14) cannot be downplayed and the proposed mitigation measures do not provide reassurance that our future understanding of the biological resources will not be gravely hindered. Any reduction of, or impact to, fisheries surveys will likely result in increased	The potential disruption of NMFS marine resource survey operations is noted within the Presence of Structures IPF in the Final EIS. Potential impacts associated with this interruption could be increased uncertainty in stock assessments and changes in the fishery quotas based on existing fishery management council rules.

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	uncertainty for stock assessments, leading to changes to fisheries management and reduction in allowable catch. BOEM and NMFS must immediately work to implement strategic plans as soon as possible to minimize any 'lost time' between existing surveys and future adapted surveys.	

O.6.17. Recreation and Tourism

Table O-26. Responses to Comments on Recreation and Tourism

Comment No.	Comment	Response
BOEM-2022-0071-0232-0023	RI takes enormous pride in its boating and recreational fishing eminence. Sunrise Wind and the other OWFs slated for the coastal waters of RI will substantially impact the boating industry, whale watching, and fishing as RI Sound becomes noisy and more difficult to navigate (NOAA, McCann, 2013). Sunrise Wind, by displacing these activities, violates the Outer Continental Shelf Lands Act (43 U.S.C. §§ 1331 et seq.). The BOEM DEIS does not adequately address either the legal, monetary or cultural impact of this adverse effect.	Vessel traffic is analyzed under Section 3.19, *Navigation and Vessel Traffic,* and impacts can then be carried into Section 3.21, *Recreation and Tourism*, and Section 3.14, *Commercial Fisheries and For-hire Recreational Fishing*. *Commercial Fisheries and For-hire Recreational Fishing* now provides tables summarizing revenue exposure by port and state. Traffic impacts and mitigation strategies to alleviate them are discussed in *Recreation and Tourism*. However, the *Recreation and Tourism* section does not delve into the financial implications associated with these impacts.
BOEM-2022-0071-0249-0005	The DEIS contains no analysis of how heritage tourism will be affected even though our clients depend on it for the current and future maintenance and preservation of the historic properties under their jurisdiction or control. Under NEPA, BOEM must consider a wide range of effects, specifically including impacts that are "historic, cultural, [and] economic." Tourism revenue and property values are vital to the Town of New Shoreham's and City of Newport's economy. Tourism alone is a $7.1 billion industry in Rhode Island, supporting over 87,800 jobs every year. Spoliation of historic landscapes increases the risk of lost tourism revenue and property taxes, which are expected to decrease after Sunrise Wind, Revolution Wind, and South Fork Wind industrialize the ocean landscape	Section 3.15, *Cultural Resources*, reviews the Project impacts to the significance and integrity of historic properties. Tourism and socioeconomic impacts are discussed in Sections 3.21 and 3.16, respectively. Additionally, Section 3.22 discusses scenic and visual resources and describes impacts to the character of the seascape. Impacts were determined to have negligible to moderate adverse and minor beneficial impacts on recreation and tourism. Construction activities may cause the need to adjust recreation and tourism activities due to disruptions, construction activities, and partial closures of recreational areas. All recreation areas will be accessible to the public during

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	with their unavoidable visual clutter and light. Impacts to our clients' tourism economies would be devastating to the economic health of the area and put tens of thousands of jobs at risk, creating environmental justice risks. BOEM's own numbers about the GDP of Newport County and Washington County suggest that economic harm could be even greater. Nevertheless, the DEIS does not consider it.	operation and maintenance activities. Impacts were considered based on specific areas.
BOEM-2022-0071-0249-0006	Despite this risk, the DEIS' discussion of tourism blithely dismisses potential impacts to Block Island's and Newport's economies without any serious discussion or supporting research, preferring instead to rely on flawed, incomplete studies and ignoring Orsted's own research that shows that 15% of tourists will not return to oceanfront communities once offshore wind farms are built. Thus, BOEM cannot support its conclusion that the overall impact to tourism will be "minor," especially when Project impacts at the landscape level are expected to range from "moderate" to "major adverse." BOEM must carefully consider the impacts on our clients' unique character as oceanfront communities and their historic properties that qualify as a "resource" both to the area's economy and under NEPA's definition. BOEM must further analyze and quantify these potential adverse effects as BOEM develops the Final EIS.	Section 3.15, *Cultural Resources*, reviews the Project impacts to the significance and integrity of historic properties. Tourism and socioeconomic impacts are discussed in Sections 3.21 and 3.16, respectively. Additionally, Section 3.22 discusses scenic and visual resources and describes impacts to the character of the seascape. Minor adverse impacts are defined as "impacts [that] would not disrupt the normal functions of the affected activities and communities." Moderate adverse impacts are defined as "the affected activity or community would have to adjust somewhat to account for disruptions due to the project." Impacts were determined to have negligible to moderate adverse and minor beneficial impacts on recreation and tourism. Construction activities may cause the need to adjust recreation and tourism activities due to disruptions, construction activities, and partial closures of recreational areas. All recreation areas will be accessible to the public during operation and maintenance activities. Impacts were considered based on specific areas.

O.6.18. Sea Turtles

Table O-27. Responses to Comments on Sea Turtles

Comment No.	Comment	Response
BOEM-2022-0071-0242-0023	Abundance Estimates for Sea Turtles: New sea turtle density models are due for imminent release by the Navy and are available to inform environmental impact analyses upon request; BOEM should request these data from the Navy and use that information to update estimates for the Project Area.	Sea turtle density estimates for SRWF were derived from the new models and added to Table 3.12-1.
BOEM-2022-0071-0242-0026	For sea turtles, BOEM has determined through its impact analysis that impacts will be "negligible to minor adverse impacts." BOEM's determination is based on the potential for the presence of offshore wind structures to be beneficial to individual sea turtles due to the creation of artificial reefs, additional foraging habitat, shelter from predation and strong currents, as well as additional opportunities to remove biological build-up on their carapaces. However, this assumption should be validated through appropriate monitoring and research. We also urge BOEM to carefully consider how these benefits are counterbalanced by adverse impacts from pile driving noise and increased vessel traffic.	Adverse and beneficial impacts have been weighed separately. Specifically, BOEM does not consider the possibility of beneficial effects to offset the adverse impacts. Adverse impacts must be properly avoided or mitigated regardless of the potential for beneficial impacts. This provides a conservative (protective) approach. Estimating the potential for offsetting effects from beneficial impacts is beyond the scope of the Proposed Action.

Comment No.	Comment	Response
BOEM-2022-0071-0242-0027	In its description of the Proposed Action, the DEIS states that between one and three piles may be installed per day with between 1-4 hours of impact pile driving expected per pile under normal substrate conditions. However, the acoustic impact analysis for marine mammals and sea turtles uses a different set of assumptions. For example, the pre-start clearance zones are based on the modeling assumption that either one or two monopiles, and either two or three pin piles are driven per day. The modeling scenarios used to estimate impacts to marine mammals are different again, assuming the installation of two to four pin piles and one to four monopiles per day. To determine radial distances to effect levels for sea turtles, up to four monopiles and four pin piles installed in a single day were modeled. These inconsistencies leave the results of the impact analysis and appropriateness of the size of the pre-start clearance and shutdown zones in serious question. BOEM must revise its analysis so that it is consistent and reflects the true project design envelope.	Acoustic modeling included in the EIS is based on the potentially most impactful set of parameters among modeled scenarios, based on the range of potential construction scenarios proposed in the COP. As described in the PSMMP for sea turtles and ESA-listed fish species, the pre-clearance and shutdown zones are based on the range to potential PTS injury with a buffer. As described in the PSMMP for marine mammals and sea turtles and listed-fish species, NMFS approved changes to pre-clearance and shutdown zones may be requested and incorporated based on updated information or sound source verification data that is required as part of the proposed action. We will edit the language describing the modeling for consistency and clarity.

O.6.19. Scenic and Visual Resources

Table O-28. Responses to Comments on Scenic and Visual Resources

Comment No.	Comment	Response
BOEM-2022-0071-0232-0021	The 968-foot-tall wind turbines will be much more visible than the company's simulations imply and will flash red lights during the night. Human visual processing enlarges objects on the horizon. This phenomenon, called the Ponzo illusion, explains why a full moon rising on the horizon appears much larger than the same moon, once it is overhead (Gregory, 2013). Humans will experience the turbines as far more sizable than the simulations convey. Human visual processing also pays more attention to moving objects than stationary ones. As a result, humans will be keenly aware of these structures on the horizon. BOEM has not adequately considered the visual impact.	BOEM has determined that the visual simulations prepared by the Lessee are adequate for assessing visual impacts. BOEM does not intend to prepare any additional simulations or media. The EIS summarizes previously prepared technical reports to aid the reader in the understanding of resource impacts. COP Appendix Q1, *Visual Impact Assessment* further outlines the methodology associated with the development of the simulations as part of the technical report and subsequent findings.
BOEM-2022-0071-0232-0022	RI and the nation as a whole suffer from a mental health crisis and increased drug abuse. Encounters with nature improve both mental and physical health by providing a sense of awe (Lopes, 2020; Chirico, 2021, Monroy, 2022). Compromising the ocean's natural state will potentially exacerbate the country's mental health problems by destroying a source of visual peace and open space. BOEM has failed to take this adverse impact into its analysis.	BOEM has considered the potential impacts from the presence of both onshore and offshore structures in the visual GAA (Section 3.22) and has determined that the presence of these structures would affect the character of the seascape, open ocean, landscape character, and viewer experience. The magnitude of impact is defined by the noticeable features; distance and field of view (FOV) effects; view framing and intervening foreground; and the form, line color, and texture contrasts, scale of change, and prominence in the characteristic seascape, open ocean and landscape.
BOEM-2022-0071-0249-0014	The visual simulations BOEM provided for review are incomplete and inadequate. As a result, they fail to show	BOEM has determined that the visual simulations prepared by the Lessee are adequate for assessing visual

Comment No.	Comment	Response
	the actual impact of Sunrise Wind. Consequently, BOEM must include additional simulations to assess accurately adverse impacts and to determine appropriate avoidance, minimization, or mitigation measures. As the lead federal agency, BOEM must provide consulting parties and the public with adequate and easily accessible information that informs all parties of potential impacts. BOEM's adverse effect characterizations and visual simulations are too limited to show the full extent of Sunrise Wind's aesthetic impacts. BOEM and consulting parties, therefore, are operating at an informational disadvantage that assures arbitrary and capricious decision making.	impacts. BOEM does not intend to prepare any additional simulations or media. The EIS refers to previously prepared technical reports to aid the reader in the understanding of resource impacts. COP Appendix Q1, *Visual Impact Assessment* further outlines the methodology associated with the development of the simulations as part of the technical report and subsequent findings.
BOEM-2022-0071-0249-0016	Adding to the problem of insufficient visual simulations from historic properties, including all NHLs, BOEM's visual simulations are taken only at a single time of day during a single season. They represent a small fraction of adversely affected historic properties. They do not show construction impacts. And all simulations are from a single vantage at ground level, even though property owners, the public, and visitors to those properties experience the historic ocean viewshed from different vantage points, such as from the tops of lighthouses, church steeple balconies, widow walks, or the upper stories or verandahs of houses—spaces designed intentionally for this type of observation.	BOEM has determined that the visual simulations prepared by the Lessee are adequate for assessing visual impacts. BOEM does not intend to prepare any additional simulations or media. The EIS refers to previously prepared technical reports to aid the reader in the understanding of resource impacts. COP Appendix Q1, *Visual Impact Assessment* further outlines the methodology associated with the development of the simulations as part of the technical report and subsequent findings.
BOEM-2022-0071-0249-0017	Overall, as we have previously explained in earlier comments, the visual simulations provide a "best case" representation only of the Project's visual impacts. BOEM does not provide enough information for the	Appendix Q1 of the COP (EDR 2022), *Offshore Visual Impacts Assessment*, states, "The VIA was prepared with oversight and input provided by landscape architects and other visual professionals experienced in the

Comment No.	Comment	Response
	Newport Parties and Block Island Parties, or other consulting parties, to evaluate less favorable scenarios.	preparation of VIAs. It is also consistent with the policies, procedures, and guidelines in established VIA methodologies, and in accordance with the Visual Impact Assessment Study Plan." The visual simulations were prepared based on the PDE approach, which considers a geographic area that is larger than what will ultimately be required for the development of the Project. This approach allows developers to account for locations within the PDE that are unsuitable for development due to constructability, cultural, or economic limitations. The PDE includes the contiguous areas closest to the mainland shoreline and therefore represents the greatest level of potential visual impact associated with the Project.
BOEM-2022-0071-0249-0018	Furthermore, BOEM has not fully shown consulting parties or the public how Sunrise Wind will address potential lighting impacts, including during the construction phase. Prolonged, constant, and bright lights will be required to construct the WTGs, as well, and this lighting will cause major impacts to our clients' views for at least close to a decade when all of Orsted's projects are considered cumulatively. BOEM must include construction impacts, including lighting, in its final analysis of impacts to historic properties so that consulting parties and the public can evaluate them. Our clients are especially concerned about lighting impacts to the dark night sky both during and after construction and urge BOEM to take a hard look at these impacts. In addition, BOEM must consider the visual impacts of all light units on each turbine and their reflections on the	The visual resource analysis addresses non-historic visual resources and states, "When the lights are on, it would result in a major impact within the range of the viewer, but when the lights are off there would be no impact from them." Impacts would be dependent on the distance, presence of existing onshore and offshore light sources, meteorological conditions, and angle of view. BOEM has addressed construction lighting in the Final EIS. Section 3.15.5.1.2 addresses construction lighting for the Proposed Action. The text notes that construction lighting will be variable based on location and distance and that this will change over the course of construction as work moves throughout different portions of the Lease Area. The text further notes that impacts would be limited to those cultural resources for which a dark nighttime sky is a contributing element, a

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	ocean's surface, especially during nighttime hazy conditions that will magnify their glow—and how nighttime light pollution will further diminish the integrity of all historic properties and NHLs within the APE.	smaller subset of reviewed cultural resources. The text concludes that since the lighting is temporary and will change throughout the construction period, the impacts are minor.

O.6.20. Water Quality

Table O-29. Responses to Comments on Water Quality

Comment No.	Comment	Response
BOEM-2022-0071-0229-0013	Water Quality/Fisheries Impacts: BOEM's analysis, or lack thereof, pertaining to the proposed open cooling water intake system for the Project's offshore converter station (OCS-DC) as an "impact producing factor" affecting water quality is truly remarkable. Page 3-37 of the DEIS states that "Table G4 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to water quality". However, upon visiting Appendix G, Section 1.1.2 Water Quality, the reader is led to a simple Table G-4 "Potential Impact Producing Factors on Water Quality", the contributing IPFs include accidental releases, anchoring, cable emplacement and maintenance, discharges, land disturbance, port utilization, presence of structures." There is no analysis contained in the Appendix. Neither is there any real analysis contained in the DEIS.	Thank you for the comment. Further analysis regarding the cooling water intake system is provided in Sections 3.5.5.2 *Water Quality*, *Operations and Maintenance*; 3.7.5.2.2 *Benthic Resources*, *Operations and Maintenance, Offshore Activities and Facilities*; and 3.10.5.2.2 *Finfish Invertebrates and Essential Fish Habitat, Operations and Maintenance, Offshore Activities and Facilities*.
BOEM-2022-0071-0229-0014	The section of the DEIS that discusses the operation of the OCS-DC states that the daily design intake flow of the OCS-DC would be 8.1 million gallons per day, with maximum daily discharge of 90 degrees F. It briefly discusses thermal plume size, location, modeling, and mixing estimates, but every assertion is referenced to "TRC 2021". Upon examination of the DEIS Appendix K: References Cited, this reference correlates to "TRC Companies, Inc. (TRC). 2021. NPDES permit application. Sunrise Wind offshore converter station. December	Thank you for the comment. Currently, open-loop cooling systems are the only commercially available, effective, and reliable method for AC to DC conversion at long distances from shore and are required to be permitted through the NPDES system (Middleton and Barnhart 2022). It is an area of ongoing investigation. Sunrise Wind has applied for an NPDES Permit under Section 402 and Section 316(b) of the Clean Water Act to operate the Offshore Converter Station, including a cooling water intake system. The results from the

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	2021". Therefore, BOEM relies completely on a document prepared by the developer themselves. This is inappropriate; independent analysis is necessary. In order to review the application document cited, we also consulted Appendix A: Required Environmental Permits and Consultations", which merely mentions that the project would require a NPDES permit from the EPA but contains no permit documentation pertaining to this permit/permit application. In Appendix N2 of the COP, we can find a 2022 document prepared by the developer entitled "Ichthyoplankton Entrainment Assessment", but as that document is dated 2022 not 2021, it is difficult to tell if this is the document referenced by the DEIS in the Water Quality section. Therefore, it is impossible to comment on the sole document and rationale that BOEM has provided for a very major impact to the environment. BOEM conducts no analysis itself, other than to regurgitate a developer document. It references no other studies pertaining to impacts of open cooling water intake systems, which are now banned in New York State waters due to the devastating environmental impacts produced by such systems. It is difficult to see how New York State would approve a project that would violate their own regulations if placed in state waters. And it is difficult to see how BOEM can estimate the impacts from this type of system- banned in the very state requesting the project- when it refers to no documentation or environmental studies other than the developer	hydrothermal modeling completed for the permit application are discussed in Section 3.5.5.2 (previously section 3.4.2.5.2 in the Draft EIS). The hydrothermal modeling estimated that the thermal plume would not extend beyond the regulatory mixing zone of 330 ft (100 m) as defined by the Ocean Discharge Criteria in the NPDES regulations; thus, effects on water quality beyond the regulatory mixing zone are not anticipated. The OCS-DC will be operated according to the requirements of the NPDES Permit. The OCS-DC is located on the Outer Continental Shelf and is not within the regulatory authority of New York State.

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	themselves. There are environmental reasons that these systems are now outlawed in many other locations. But none of these have made it into BOEM's analysis. Therefore, BOEM conducted no analysis. We request that BOEM explore scientific and environmental analyses that pertain to open cooling water intake systems on the marine environment and publish this analysis/literature review in a supplemental EIS. This is particularly important regarding water quality as it affects fishery resources. For example, in Southern California alone, open cooling water intake systems have been estimated to cost the fishing industry over $9 million a year (in 2005 dollars), which is an underrepresentation of true impacts as only 20 of 258 species affected were important to the fishing industry. If the California Energy Commission can provide such an analysis, then a major federal agency such as BOEM could also conduct such an analysis to estimate the biological and fishery impacts of the Proposed Project. We request that BOEM do so and provide that analysis in a supplemental EIS for further public comment.	
BOEM-2022-0071-0229-0017	The lack of any species specific or substantial analysis in the DEIS regarding the OCS-DC is deafening, even in basic terms without detailed fisheries/stock analysis. BOEM's section 3.4.2.5.5 Conclusions on Impacts from the Proposed Action state that impacts on water quality would be negligible or minor based on "sediment suspension, deposition and increased turbidity" during "during anchoring, cable emplacement and	Thank you for the comment. Currently, open-loop cooling systems are the only commercially available, effective, and reliable method for AC to DC conversion at long distances from shore and are required to be permitted through the NPDES system (Middleton and Barnhart 2022). It is an area of ongoing investigation. Sunrise Wind has applied for an NPDES Permit under Section 402 and Section 316(b) of the Clean Water Act

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	maintenance, and seafloor/land disturbance" but that sediment plumes would be "localized and short term." The conclusion also states that should an accidental release of oil/lubricant/debris, etc. to occur, the impacts would be "minor to moderate" but also only "short term". The Conclusions section on Water Quality completely omits any conclusion or impact analysis from the OCS-DC of 8.1 million gallons per day of 90 degree F effluent. This is truly astonishing for the most major water quality impact producing factor of the proposed Project. This is clearly not an accidental omission by the agency, as such an obvious and significant omission could only be made intentionally. Open cooling water intake systems have been the subject of much litigation from environmental groups over the years, as well as the subject ofenvironmental group discourse on power plant modernization, due to the tremendous environmental impact that such systems have on the aquatic environment and aquatic species. Data for similar impacts exist and should be utilized in an independent analysis by the agency. In fact, BOEM's Table ES-2 entitled "Summary and Comparison of Impacts among Alternatives with No Mitigation Measures" lists the same impacts to water quality for the No Action Alternative as for the Proposed Action Alternative. This is completely preposterous and fails even the most basic redface test. Not having an	to operate the Offshore Converter Station, including a cooling water intake system. The results from the hydrothermal modeling completed for the permit application are discussed in Section 3.5.5.2 (previously Section 3.4.2.5.2 in the DEIS). The hydrothermal modeling estimated that the thermal plume would not extend beyond the regulatory mixing zone of 330 ft (100 m) as defined by the Ocean Discharge Criteria in the NPDES regulations; thus, effects on water quality beyond the regulatory mixing zone are not anticipated. The OCS-DC will be operated according to the requirements of the NPDES Permit.

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	open cooling water intake system cannot have the same impacts to water quality as having an open cooling water intake system that releases 8.1 million gallons of 90 degree F effluent per day. We note again that no other projects proposed thus far via the DEIS process have applied for or evoked the need for an open cooling water intake system offshore converter station. Therefore, this type of impact would not even exist, not even in a cumulative impacts analysis, except for the proposed Project.	
BOEM-2022-0071-0232-0013	As mentioned above, considering the Executive Order's dictum to tackle the climate crisis both at home and abroad, the DEIS does not adequately consider the global implications of the project's effect on ocean currents, wave height, and temperature stratification. BOEM knows that these offshore wind projects will decrease wave height, diminish current strength, and alter temperature stratification from its hydrodynamic modeling study (HDM, BOEM_2021-049). These changes could alter both the Atlantic Meridional Overturning Circulation (AMOC) and the Gulfstream. Because any decrease in the Gulfstream or the AMOC can have dramatic effects on sea-level rises (Goddard 2015), and global weather patterns (Carrington 2021), BOEM should not accept the DEIS until these hydrodynamic changes are considered in a global context, as the executive order implies.	The Final EIS discusses the effects from the presence of wind turbines on water mixing patterns and water quality in Sections 3.5.3.2 and 3.5.5.2 (previously 3.4.2.3.2 and 3.4.2.5.2 in the Draft EIS).

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BOEM-2022-0071-0232-0014	Increased stratification and temperature changes described by the HDM studies will alter both the amount and the timing of plankton blooms. This can have downstream effects on migratory species that arrive in exquisite timing with seasonal blooms. Studies from both China and the North Sea demonstrate that offshore wind projects can reduce plankton counts (Daewel, 2022), decrease biodiversity (Wang, 2022), and alter the distribution of plankton blooms (Slavik, 2018). A mere 1% decrease in phytoplankton will cause an increase in CO2 emissions that outweighs any possible benefit from renewable energy sources (Malerba, 2019). The Sunrise Wind DEIS calculates the construction and installation will kill billions of plankton. BOEM does not adequately consider the cumulative effect, the interactions between primary production and other species, the impact of primary production on CO2 emissions and O2 production (Falkowski, 2012), nor does it incorporate the latest scientific findings from the North Sea and China. Please rectify this omission.	The Project may result in localized changes in plankton production. But as stated in the paper cited by the commenter (Daewel et al. 2022), these changes can be up to +/- 10 percent locally but less than +/-1 percent in the area surrounding the wind farm, with local oceanographic factors playing a role in the change. Specifically, according to Daewel et al. (2022), "In these regions it is difficult to conclude on the overall trophic response, since the average fractional change in biomass is very small and shows a large regional variation." Temperature stratification is discussed in Sections 3.5.5 *Water Quality*, 3.10.5 *Finfish*, and 3.11.5 *Marine Mammals*.
BOEM-2022-0071-0232-0024	First the construction and installation and then the tidal and estuary currents flowing across the underwater portion of the wind turbines can resuspend toxic heavy metals (Chen, 2022), re-introducing them into the food supply chain, and threatening marine mammals (Huang, 2022). Toxic compounds, since the time of the industrial revolution, have settled in the lease areas off Rhode Island. Bioaccumulation and biomagnification can increase the potential harm these compounds can cause. As a result, Sunrise Wind will potentially violate	There are no known ocean disposal sites along the cable route or in the SRWF Project Area as mentioned in Section 3.5.5.1.2 and 3.20.1.1. The USEPA's Ocean Disposal Map is located at the following link: https://www.epa.gov/ocean-dumping/ocean-disposal-map.

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	the Clean Water Act (33 U.S.C §§ 1251 et seq.) and Seafood Safety Regulations (21 C.F.R. § 123). The BOEM DEIS does not incorporate the latest scientific findings, nor does it consider the legal implications or the significant health consequences of resuspending toxic compounds in this area.	
BOEM-2022-0071-0232-0025	In addition to the resuspension of toxic compounds, the DEIS does not consider the cumulative impact and the interactions between other aspects of the project that will degrade water quality. The anti-corrosive coating on the wind turbines will leach significant levels of toxic heavy metals (lead and cadmium) (Reese, 2020) into the water. Leading edge erosion emits microplastics containing Bisphenol A (BPA) and “forever” per- and polyfluoroalkyl substances (PFAS) into the water which can then contaminate the marine food chain. Contaminating water in an area essential to fishing may violate the Clean Water Act (33 U.S.C §§ 1251 et seq.) and Seafood Safety Regulations (21 C.F.R. § 123). The BOEM DEIS does not adequately address this significant impact on the marine environment and on human health. https://docs.wind-watch.org/Leading-Edge-erosion-and-pollution-from-wind-turbineblades_5_july_English.pdf	The potential influence of corrosive emissions from offshore infrastructure is discussed in Section 3.5.3.2. The limited research conducted to date has shown that while corrosive emissions may occur, the amount and effect varies with site (e.g., local salinity and water quality conditions). For example, the 'Chemical Emissions from Offshore Wind Farms' study in the North Sea found that (1) detected concentrations of metals (e.g., aluminum, zinc, indium, lead, cadmium) were sporadically high but that concentrations were predominantly within the range of normal variability and that (2) based on the prevailing dilution and distribution processes in the North Sea, there were no discernible effects due to the use of galvanic anodes (BSH and Hereon 2022). Epoxy resins containing Bisphenol A (BPA) are one of many types of potential coatings for wind turbines. However, there is insufficient data currently available to evaluate its potential effect on the environment. Federal agencies, such as the EPA, are currently evaluating the impacts of BPA and polyfluoroalkyl substances (PFAS) and developing regulations.

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BOEM-2022-0071-0232-0026	Wind farms can increase water and air temperatures, redistribute humidity, and alter atmospheric flow, thereby modifying local weather patterns and regional climate (Miller, 2018). Raising ambient temperatures can affect fish larvae (Moyano, 2017), ocean currents (Christiansen, 2022), and vegetation (Diffendorfer, 2022) The BOEM DEIS does not consider the latest scientific findings, nor does it adequately address this significant issue. Assuming that climate change will do worse is not a valid justification for known and significant impacts.	Thank you for your comment. Information on the influence of wind turbines/structures on the hydrodynamic conditions within an offshore wind farm is included in Section 3.5.5.2, *Water Quality*, and has been added to 3.10.5.2, *Finfish, Invertebrates, and Essential Fish Habitat,* and Section 3.11.5.2, *Marine Mammals*.
BOEM-2022-0071-0248-0042	The proposed action, and each of the alternatives, includes an offshore converter station (OCS). There will be interarray cables, proposed to be buried at 3 - 7 foot depths, transmitting AC power from the turbines to the OCS. The AC power will be converted to DC power before being transmitted ashore. During operation, the OCS requires continuous cooling water withdrawals and subsequent discharge of heated effluent back to the receiving waters. Three intake pipes are proposed to be positioned 30 feet above the seafloor. Each intake pipe opening will be 21.6 square feet and have a downward orientation. One outflow pipe is proposed and will be positioned 40 feet below local mean sea level. The outflow pipe will also have a downward orientation and the total discharge opening is 5.4 square feet.32 The maximum daily average discharge temperature would be 90oF, and the daily average discharge temperature would be 86oF. While the maximum inflow and outflow volumes are 8.1 million gallons per day (MGD), it is expected the daily intake flow would range from 4.0 to	Thank you for the comment. Currently, open-loop cooling systems are the only commercially available, effective, and reliable method for AC to DC conversion at long distances from shore and are required to be permitted through the NPDES system (Middleton and Barnhart 2022). It is an area of ongoing investigation. Sunrise Wind has applied for an NPDES Permit under Section 402 and Section 316(b) of the Clean Water Act to operate the offshore converter station, including a cooling water intake system. The results from the hydrothermal modeling completed for the permit application are discussed in Section 3.5.3.2. The hydrothermal modeling estimated that the thermal plume would not extend beyond the regulatory mixing zone of 330 ft (100 m) as defined by the Ocean Discharge Criteria in the NPDES regulations; thus, effects on water quality beyond the regulatory mixing zone are not anticipated. The OCS-DC will be operated according to the requirements of the NPDES Permit. Please note the burial depth for the IAC has changed from 3 to 7 ft

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	5.3 MGD. Based on modelling, the DEIS forecasts "some highly localized increases in water temperature in the immediate vicinity of the discharge location of the OCS". Without much analysis, the DEIS concludes that impacts from the thermal plume (heated effluent) are expected to be minor. It is telling that NO other project for which a DEIS has been prepared proposes to utilize an offshore converting station. We recommend additional analysis and justifications for BOEM's finding of minor impacts from the thermal plume.	(0.9 to 2.1 m) to 4 to 6 ft (1.2 to 1.8 m) based on the newest COP published in September 2023 (Sunrise Wind 2023b).
BOEM-2022-0071-0248-0043	Similarly, the DEIS glosses over the role chlorine will play in the cooling process. "The chlorine proposed to be added to the cooling water during normal operation would dissipate prior to discharge." This appears to be the only reference to chlorine included in the DEIS and COP. If Sunrise intends to mix chlorine in the cooling water, more details are necessary to effectively comment. For example: what levels of chlorine are expected? What safeguards will be in place to contain chlorine should it not dissipate prior to discharge?	Additional information regarding the electro chlorination system was added to Section 3.5.7.2.2.

O.6.21. Wetlands and Waters of the U.S.

No comments were made on Wetlands and Waters of the U.S. by Stakeholders

O.6.22. Mitigation and Monitoring

Table O-30. Responses to Comments on Mitigation and Monitoring

Comment No.	Comment	Response
BOEM-2022-0071-0158-0008	Identify which mitigation measures are assumed for the purpose of impacts determinations	All APMs are considered part of the Proposed Action and alternatives, excluding the No Action Alternative. Other mitigation measures developed during the EIS through comments and consultations are listed in Appendix H and at the end of each resource section in Chapter 3.
BOEM-2022-0071-0158-0035	Mitigation measures are necessary to reduce the potential negative environmental and socioeconomic impacts of the Sunrise Wind project. The recommendations outlined in our offshore wind energy policies, referenced above, should be reflected as terms and conditions for approval of the project. We provided a separate comment letter on the draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries. These comments supported many of the mitigation measures recommended in that draft guidance. We recommend that all final mitigation guidelines be reflected in terms and conditions for BOEM's approval of this project. This is especially important given the DEIS only states that "the lessee shall implement a gear loss and damage compensation program consistent with BOEM's draft guidance…" (page H-67). Furthermore, there is reference in Appendix H that Ørsted's corporate policy and procedure will be implemented to compensate for any commercial/recreational fishing entities gear loss, however, this policy is not hyperlinked or provided.	BOEM has reviewed the Council's wind policy referenced and concurs with the content of the document. BOEM also finds that the document is consistent with the approach of the EIS with respect to stakeholder engagement, BMPs, and environmental review considerations (e.g., navigation and safety, evaluation of impacts on fisheries). Therefore, no changes to the EIS are needed.

Comment No.	Comment	Response
BOEM-2022-0071-0158-0036	Appendix H includes the analyzed potential mitigation and monitoring measures; however, it is unclear which of these measures are likely to be required by BOEM as opposed to optional. Assumptions about which mitigation measures are required will affect the impact determinations and overall conclusions in the FEIS. For example, time of year restrictions on construction can be used to protect sensitive spawning and fishing periods. This is being proposed for the summer flounder HAPC (page H-10), which the MAFMC designated as all native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations. In addition, "time-of-year in-water restrictions to the extent feasible to avoid or minimize impacts to Atlantic sturgeon" are included as mitigation measures (page H-10), though it is not clear what type of monitoring and minimization plans will be put in place. The Councils are supportive of time of year restrictions to reduce potential impacts to sensitive life stages of fishery species, to reduce impacts to fisheries, and to avoid impacts to submerged aquatic vegetation and other structured habitats throughout the project area and cable route. However, further detail should be provided in the FEIS on how this would be done and what exactly these measures would achieve. We recommend working with NOAA Fisheries on impact determinations and identification of sensitive habitats and fishing periods to avoid as ways to mitigate impact.	Thank you for your comment. APMs (Table H-1 in Appendix H) are included in the analysis and impact determination for the Proposed Action and alternatives, with the exception of the No Action Alternative. Other mitigation measures proposed by agencies or BOEM are included in Table H-2 to Table H-3 and would include additional mitigations that can further reduce the impacts on resources. These additional measures will be identified for implementation in the Record of Decision. Mitigation and monitoring measures required through permits (Section H.4 in Appendix H) will be required if permits are approved and the Project is approved for development.

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BOEM-2022-0071-0158-0038	The Councils are also concerned with the scour protection measures included within the DEIS (e.g., rock placement, mattress protection, sandbags, and stone bags). Per the Council's offshore wind energy policy, we recommend that if scour protection or cable armoring is needed, the materials should be selected based on value to commercial and recreational fish species. Natural materials, or materials that mimic natural habitats, should be used whenever possible. These materials should not be obtained from existing marine habitats and must not be toxic.	Thank you for your comment, a mitigation measure has been included in Appendix H which states, "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."
BOEM-2022-0071-0158-0039	The DEIS states that the developer will include ways "to mitigate operational impacts on oceanographic high-frequency radars" (page H-51). The fishing industry has proven to be adaptable in the face of change; however, more deliberate mitigation measures that support vessel radar upgrades could minimize impacts to fishermen and others navigating through and around the project area. An adaptation fund is included within the mitigation measures identified in the Empire Wind DEIS. We recommend a similar fund for Sunrise Wind to support vessel radar upgrades and training to help minimize impacts to fisheries and others navigating through and around the project area.	In the revised COP (September 27, 2023), Sunrise Wind added an EPM that confirms that "Sunrise Wind will establish a … Navigation Safety Fund". See Table ES-1, Section 4.7.4.3, and Table 4.9-1 in the COP. Sunrise Wind provided additional information regarding this fund to BOEM in response to Requests for Interest (RFIs) on July 12, 2023, and May 12, 2023. That information is copied below for reference. Final measures have been incorporated within NYSDOS (received August 24, 2023), Rhode Island Coastal Resources Management Council (received September 7, 2023), and Massachusetts Office of Coastal Zone Management's (received October 6, 2023) Coastal Consistency Determinations. The Rhode Island Coastal Resources Management Council and Massachusetts Office of Coastal Zone Management

Comment No.	Comment	Response
		determinations each include a Navigational Enhancement and Training Program Term Sheet, which outline the Program objectives, approach and eligibility, funding/cap, administration, and redemption process. The New York Determination references a Letter of Intent (LOI) executed by Sunrise Wind and NYSDOS to enter into a Memorandum of Understanding concerning certain proposed mitigation measures. The LOI includes an agreement by Sunrise Wind to contribute to an established Navigational Safety Fund to enable commercial fishermen and for-hire vessels to acquire navigation equipment 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 Navigation Enhancement and Training Program. July 12, 2023, Response to RFI: A Navigational Safety Fund will be established within 30 days of receipt of all final federal, state, and local permits, authorizations, concurrences, and approvals necessary to construction and operate the Sunrise Wind Project and will exist until funds run out. The Navigational Safety Fund will enable eligible commercial fishermen and for-hire vessels to acquire navigation equipment through a voucher system and will also provide training and experimental learning opportunities to those navigating within Ørsted/Eversource's Lease Areas off the coast of Rhode Island and Massachusetts.

Comment No.	Comment	Response
		The Navigational Safety Fund was described in a RFI response provided on May 12, 2023 and will be similar to and carry out the same intent as the program established for South Fork Wind (see Sunrise Wind's Rhode Island Federal Consistency Decision, pg. 727) and Revolution Wind (see Revolution Wind's Rhode Island Federal Consistency Decision, pg. 200). May 12, 2023, Response to RFI: The Navigational Safety Fund will be in place 30 days after the receipt of all final federal, state and local permits, authorizations, concurrences, and approvals necessary to construct and operate Sunrise Wind as described in the approved COP and will exist until funds run out. The Navigational Safety Fund will enable eligible commercial fishermen and for-hire vessels to acquire navigation equipment through a voucher system. The Navigational Safety Fund will be similar to and carry out the same intent as the program established for South Fork Wind. It will also provide training and experiential learning opportunities to those navigating within Ørsted/Eversource's lease areas off the coast of Rhode Island and Massachusetts. Fishermen eligible for the Rhode Island and Massachusetts Direct Compensation Programs and who do not already possess AIS transceivers and/or pulse compression radar systems may receive one-time grants for up to $10,000 in order to upgrade or purchase pulse compression radar or AIS. Commercial fishing vessels and inspected for-hire/party vessels will be eligible for $10,000 in upgrades and uninspected for-hire vessels will be eligible for $5,000 in upgrades. Eligible fishermen will be issued vouchers to spend at approved vendors for approved products. The

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		process of issuing vouchers, approving vendors, and approving equipment will be managed by a third party which could be the same third-party managing the Direct Compensation Program. In addition to vessel upgrades, there will be an educational component to the Navigational Safety Fund. Those eligible for direct compensation, may attend a professional training of their choice with support up to $1,000 per person. Eligible trainings include but are not limited to a captain's course, license upgrade, radar course, or rules of the road refresher. Like vessel upgrades, a third-party manager will issue vouchers for training and be responsible for approving trainings, trainers, educators, and/or institutions. www.crmc.ri.gov/windenergy/dwsouthfork/SFWF_FedConsistencyDecision_20210701.pdf
BOEM-2022-0071-0158-0040	Unexploded ordnances (UXOs) can be uncovered during site preparation activities. Exposed UXO presents a significant risk to mariners, especially those towing mobile gear that could bring UXO to the surface. Offshore wind project construction activities can uncover UXOs. We recommend that the terms and conditions specify that developers are responsible for the safe disposal of UXO exposed due to construction activities. Our understanding is that some UXOs might be detected via surveys but are not exposed; in such cases, only mariner notification may be sufficient given disposal may present greater risks. Clear, timely, and repeated communication about UXO locations and any changes in the location or status of UXOs is essential and should not rely only on email notifications	Sunrise Wind has addressed UXO/MEC disposal in Appendix H. BOEM cannot require disposal of unexploded ordinances. In the event a confirmed UXO/MEC is discovered, the Lessee coordinates with the United States Coast Guard to ensure it is published in the next version of the Local Notice to Mariners.

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BOEM-2022-0071-0158-0041	Appendix H includes mention of a boulder relocation plan that includes 1) identification of active bottom trawl fishing, areas where boulders > 2m in diameter are anticipated to occur, and areas where boulders are expected to be relocated, and 2) identification of methodologies to minimize the number of seafloor obstructions (page H-14). We recommend developing a clear strategy for boulder relocation that is protective of habitats in the area, potentially relocating them to soft bottom directly adjacent to existing hard bottom areas. Mobile gear fishing activity should be considered when planning specific placement options; relocation areas with similar habitat impacts might have higher or lower potential for conflict with trawling and dredging activities. Recreational fishermen often fish on boulder habitats. We recommend that maps post boulder relocation sites be made available to recreational and commercial fishing communities and others.	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 bottom-trawl fishing (within the last 5 years), areas where boulders greater than 2 m in diameter are anticipated to occur, and areas where boulders are expected to be relocated for Project purposes. 2. Methods to minimize the number 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 placed, the method(s) for moving the boulders, and measures taken to minimize impacts, as technically and economically feasible. 4. Outreach conducted regarding the boulder relocation plan (e.g., notifications to mariners).
BOEM-2022-0071-0198-0002	A recent draft report released by the Woods Hole Oceanographic Institution ("WHOI") regarding fishing exposure for Sunrise and Revolution Wind estimates that Sunrise wind will have a total impact on the commercial fishing economy in Massachusetts during the 30-year lifespan of the project of $4,926,000. This includes an estimated loss of only $629,000 "from forgone fishing during the wind farm's operation." It is our position that these numbers drastically underestimate the impact of these	Thank you for your comments. BOEM has proposed a fisheries mitigation measure that includes mitigation for potentially impacted shoreside services (see Section 3.14.11, Table 3.14-25 and Appendix H, Table H-3, "Proposed Fisheries Mitigation Measures" under Other Agency-proposed Mitigation Measures), based on BOEM's draft fisheries mitigation guidance. https://www.boem.gov/renewable-energy/reducing-or-avoiding-impacts-offshore-wind-energy-fisheries. BOEM will consider incorporating the fisheries

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	developments, especially during the operational phase. There are serious concerns within the commercial fishing industry about the potential impacts to their livelihoods from the construction and operations of the offshore wind developments. While the offshore wind industry is brand new to the United States and the northeast waters and has yet to become operational, the concerns and uncertainty of the fishermen are certainly justified. It is more than reasonable to expect there will be significant adverse impacts to commercial fishing. Exposure analyses such as these that downplay or seem to suggest negligible impacts can only serve to sow doubt within the commercial fishing industry that their concerns are being taken seriously now and will be acknowledged and addressed when they are experienced in the coming years. We believe that it is vital that the actual impact of the development of offshore wind on the economy and people of Massachusetts be established using the best available data, methods and information to truly measure the impact of this project on our fishing industry and those that support it. Throughout the Sunrise Wind COP DEIS draft, mitigation measures are defined as "best practice, not an enforceable measure." We continue to argue that any appropriate and successful mitigation and compensation program for the commercial fishing industry must codified in Federal law.	mitigation measures as a condition of COP approval.

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	Therefore, it is imperative that all offshore wind developers, federal partners, and fishing industry, collectively advocate for such outcomes.	
BOEM-2022-0071-0205-0025	Pre-construction, construction, and post-construction monitoring should be conducted, especially in areas of known vulnerability such as those adjacent to known sources of contaminants and near environmental justice communities.	Thank you for your comment. Proposed mitigation and monitoring measures, including pre-construction, construction, and post-construction surveys, can be found in Appendix H.
BOEM-2022-0071-0205-0026	The FEIS should include any request made by the community that are publicly available, such as, but not limited to, request for Community Benefits Agreements, port electrification, and community governance of offshore wind projects.	Thank you for your comment. Mitigation and monitoring measures proposed in the commenting process were considered for inclusion in the mitigation and monitoring appendix (Appendix H).
BOEM-2022-0071-0242-0003	We recommend that BOEM include the following in their permitting of Empire Wind: Revise the sound exposure analyses for marine mammals based on a consistent set of assumptions;	The sound exposure analysis is based on the maximum impact scenario of the PDE. The completed analysis addresses the maximum impact for each foundation pile driving type under the PDE.
BOEM-2022-0071-0242-0004	Require a mandatory 10-knot speed restriction for all project-associated vessels at all times;	Thank you for your comment. Appendix H of the Final EIS has been updated to include modifications and/or additional mitigation and monitoring measures that BOEM could choose to incorporate into the Record of Decision. Additional mitigation and monitoring measures may arise from consultations and coordination with federal and state resource agencies. These additional mitigation measures could be considered by decision makers and incorporated into the Record of Decision. BOEM fully supports regional monitoring and coordination with state and cooperating federal agencies and regional fishery management councils to develop

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		appropriate mitigation measures and will incorporate results in future decisions.
BOEM-2022-0071-0242-0006	Prohibit commencement of impact pile driving during periods of darkness or poor visibility;	A nighttime pile driving plan will be developed for NMFS and BOEM to review with the intention of demonstrating that Sunrise Wind can meet the visual monitoring criteria for the Level A harassment zone(s)/mitigation and monitoring zones plus an agreed- upon buffer zone (these combined zones are referred to henceforth as the nighttime clearance and shutdown zones) with the technologies Sunrise Wind is proposing to use for monitoring during nighttime impact pile driving. If during nighttime pile driving, undetected animals are found in the clearance and/or shutdown zones, nighttime impact pile driving activities would cease as soon as possible in consideration of human safety, and NMFS, BOEM and BSEE would be notified immediately. See Appendix H for more details on nighttime pile driving monitoring and mitigations.
BOEM-2022-0071-0242-0007	Strengthen noise reduction and attenuation requirements to reflect best available control technology;	Although all sound attenuation systems can have variable effectiveness at different frequencies, there are currently a very limited number of sound attenuation systems that can more effectively target low frequencies. The availability of these systems may limit their use for any particular project. Current requirements under the MMPA and ESA call for the minimum 10 dB reduction of broadband noise levels for all marine mammals, not just mysticetes. BOEM will continue to review this issue and support workshops investigating sound attenuation technologies that would more effectively cover all frequencies of interest for a broad variety of wildlife.

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BOEM-2022-0071-0242-0008	Require improved monitoring of bird and bat presence and collision rates by including radar, visual and thermal camera systems, and Motus and GPS tracking of both listed and non-listed species; commit to deploying collision detection technology, once commercially available;	BOEM will take this comment under advisement if this new technology is proven to be an effective technology for the offshore environment. The Avian and Bat Post Construction Monitoring Plan will be made publicly available for this Project. Additional mitigation and monitoring measures may arise from consultations and coordination with federal and state resource agencies. These additional monitoring requirements would be considered by decision makers and incorporated into the terms and conditions for COP approval.
BOEM-2022-0071-0242-0009	Specify how impacts to bat and bird species will be determined from monitoring data, as well as what will trigger adaptive management;	The Applicant will develop a post-construction monitoring framework in coordination with NYSDEC, NPS, and USFWS. Additionally, the Biological Opinion from USFWS added the following Terms and Conditions: 1. Prior to the start of WTG operations at SRWF, BOEM must extract from existing Project documentation (e.g., the Biological Assessment, other consultation documents, the final EIS, the 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 the USFWS, Sunrise Wind, and NYSDEC for a 60-day review period. BOEM must address all comments received during the

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		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, the 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.
BOEM-2022-0071-0242-0012	Conduct Atlantic cod spawning surveys in the area of Sunrise Wind to better understand impacts from offshore wind development on spawning cod; and require an anchoring plan and other mitigation measures to reduce impacts to benthic habitats	Atlantic cod spawning surveys are being conducted by NOAA with BOEM funding and are already underway in the Lease Area. Sunrise Wind had also developed an Anchoring Plan. Please see Appendix H for all mitigation and monitoring measures.
BOEM-2022-0071-0242-0015	As noted in previous comments to the agency, offshore wind remains a relatively nascent technology in the United States and, as such, BOEM must closely monitor the impact of offshore wind construction and operations on wildlife and the ocean ecosystem to guide its adaptive management and future development. It is necessary to understand baseline environmental conditions prior to large-scale offshore wind development in the United States, so offshore wind impacts can be clearly understood with relation to pre-development environments. Additionally, as discussed further below, it is imperative that BOEM require robust, long-term monitoring (ideally coordinated regionally) to understand the impacts of offshore wind development on natural resources and that this monitoring data be made available to stakeholders and the public.	Thank you for the comment. BOEM has engaged in, currently engages in, and will continue to engage in monitoring of the potential impacts of offshore wind construction and operations on marine wildlife and the ocean ecosystem to guide its adaptive management and future development. BOEM has engaged in, currently engages in, and will continue to engage in collaboration with stakeholders to share information from monitoring and other research.

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	The Regional Wildlife Science Collaborative for Offshore Wind (RWSC) is a multi-sector collective created and defined by federal agencies, states, conservation organizations, and offshore wind developers to "collaboratively and effectively conduct and coordinate relevant, credible, and efficient regional monitoring and research of wildlife and marine ecosystems that supports the advancement of environmentally responsible and cost-efficient offshore wind power development activities in U.S. Atlantic waters." We urge that BOEM continue to participate in and fund RWSC to support its science plan development and to implement the monitoring and research activities identified in the science plan. BOEM, through RWSC and individually, should also continue to collaborate with state efforts (e.g., the New York State Energy and Research Development Authority (NYSERDA) Environmental Technical Working Group), scientists, NGOs, the wind industry, and other stakeholders to use information from monitoring and other research, and evolving practices and technology to inform cumulative impact analyses moving forward. As monitoring informs management practices, BOEM must require continued monitoring and employment of adaptive management practices by offshore wind projects. This will ensure that BOEM can swiftly minimize damages of unintended or unanticipated impacts to coastal ecosystems or wildlife and inform strategies for future wind projects to avoid potential impacts.	

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	Responsible development of offshore wind includes applying a framework of avoiding, minimizing, mitigating, and monitoring impacts to wildlife and wildlife habitat. Because even with best efforts to gather and consider all relevant information, considerable uncertainty exists about how offshore wind will affect marine habitats and the wildlife, we therefore urge Sunrise Wind to also support conservation efforts for potentially impacted species and habitats.	
BOEM-2022-0071-0242-0017	Under current regulations, an EIS must "inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." These alternatives are defined by the purpose and need of the project, which the agency needs to briefly specify in the DEIS. This requirement has been described in regulation as "the heart of the environmental impact statement." The courts describe the alternatives requirement equally emphatically, citing it as the "linchpin" of the EIS. The agencies must therefore "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." Consideration of alternatives is required by (and must conform to the independent terms of) both sections 102(2)(C) and 102(2)(E) of NEPA. In addition, agencies must discuss measures designed to mitigate their action's impact on the environment. For this Project, the purpose and need is defined as "to determine whether to approve, approve with modifications,	BOEM considered alternative foundations during the development of alternatives, but they were ultimately dismissed for further analysis. Rational for dismissal is presented in Table 2.2-1 of the Final EIS.

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	or disapprove Sunrise Wind's COP" based on the BOEM's authority under OCSLA, shared agency goals to deploy 30 GW of offshore wind energy capacity by 2030, while protecting biodiversity and promoting ocean co-use, and the goals of the Applicant. Of the Alternatives presented in the DEIS, we consider Alternative C-2 to best accomplish this goal, although we recommend improvements throughout these comments. We are concerned that the DEIS's failure to consider alternate turbine foundation technologies, such as gravity based and suction bucket foundations which significantly reduce noise-related impacts to marine mammals and the broader marine ecosystem, appear to be based on the applicant's conclusion that such technologies were not appropriate for this project in part based on the conclusion that they supply chains were "not mature" and "emerging technolog[ies]" not used at a commercial development. The COP states that the technologies for quiet foundations would not be feasible, but the analysis is not provided to the public for review. BOEM should evaluate and provide for public review a more robust array of foundations, like quiet foundations, that would significantly reduce impacts to the marine environment. Additionally, requiring such technologies could provide the needed impetus to mature supply chains and develop the technology at a commercial scale.	
BOEM-2022-0071-0242-0019	Many marine mammal and sea turtle species are under extreme stress due to climate change, vessel traffic and collisions, entanglement with fishing gear, underwater noise pollution, and other changes in the marine environment. It is	Thank you for your comment, BOEM has reviewed the recommended mitigation measures. Please see Appendix H for mitigation and monitoring measures that may be implemented for this Project.

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	critical to the health of many of these species that we not only transition away from climate warming fossil fuels to renewable resources such as offshore wind, but also that we develop offshore wind resources in a way that does not add additional stress or exacerbate other existing environmental stressors. To comply with the 2005 amendments to the Outer Continental Shelf Lands Act (OCSLA), BOEM must ensure that all activities related to renewable energy development on the OCS are "carried out in a manner that provides for…protection of the environment." BOEM's regulations under those amendments require Sunrise Wind to plan and conduct the project in a manner that does not cause "undue harm or damage" to natural resources or wildlife. The project must comply with the federal Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA), including the MMPA least practicable adverse impact standard for all marine mammal species, before any activities are undertaken. BOEM is also obligated by NEPA to consider the full range of potential impacts on all marine mammal and sea turtle species. We recommend BOEM review the mitigation measures we provide in Attachment 1 and incorporate them into the requirements for the Sunrise Wind project's development.	
BOEM-2022-0071-0242-0029	Vessel strikes are a leading cause of large whale injury and mortality and have been implicated as one of the major causes of death underlying the ongoing UME for North Atlantic right whales. The dire conservation status of the North Atlantic right whale means that even a single vessel strike poses an unacceptable risk as it will have population-	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 SMA during NARW migratory and calving periods, from November 1 to April 30. The following is stated in the standard plan: "Between

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	level consequences. Reproductive females and their calves are at elevated risk, exacerbating the impact of vessel strikes on the species' recovery potential. Vessel strikes also pose a significant risk to other large whale species currently experiencing UMEs, such as humpback whales and minke whales, as well as endangered fin whales and sei whales. Eliminating vessels from areas or reducing speeds to no more than 10 knots for all vessels are currently the only known ways to reduce the risk of injury and mortality to marine mammals and sea turtles from vessel strikes. Several of our groups spoke in strong support of the proposed amendments to the Vessel Speed Rule put forth by National Oceanic and Atmospheric Administration (NOAA) Fisheries and believe these measures–with certain improvements, as detailed in our letters–would significantly reduce the risk of mortality and injury of North Atlantic right whales from vessel strike. Any interaction between a vessel and a whale poses a risk of serious injury and mortality, however, risk is higher for vessels traveling at speeds greater than 10 knots. To ensure our national offshore wind industry begins on firm footing, we urge BOEM to require a mandatory 10-knot speed restriction for all project-associated vessels at all times, except in limited circumstances where the best available scientific information demonstrates that whales do not use an area. Project proponents may develop, in consultation with BOEM and NOAA Fisheries, an "Adaptive Plan" that modifies these vessel speed restrictions. However,	November 1st and April 30th: 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 North Atlantic right whales. 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 SWEC. Year Round: Vessels of all sizes will operate at 10 knots or less in any Dynamic Management Areas (DMAs)." Please see Appendix H for additional mitigation measure for the protection of marine mammals and sea turtles.

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	the adaptive monitoring methods that inform the Adaptive Plan must be proven effective using vessels traveling 10 knots or less and following a scientific study design. If the resulting Adaptive Plan is scientifically proven (i.e., via peer-reviewed scientific study) to be equally or more effective than a 10-knot speed restriction, the Adaptive Plan could be used as an alternative to a 10-knot speed restriction. The DEIS states that a complete vessel speed plan for sea turtles and ESA-listed fish will be included in the Protected Species Mitigation and Monitoring Plan (PSMMP). BOEM should provide a timeline for the publication of this document and describe how it will be evaluated and incorporated into the Final EIS, given that it is not currently available for review and public comment.	
BOEM-2022-0071-0242-0032	Based on these above-described findings of right whale habitat use, and the importance of the area for multiple age classes, socializing animals, and most importantly as core foraging habitat, we recommend BOEM extend the time period of the proposed seasonal restriction to December 1 through April 30 to reflect the period of highest detections of vocal activity, sightings, and abundance estimates of North Atlantic right whales. We also underscore that the species should be expected to be found throughout the year in and close to the Project Area, and the most stringent impact avoidance, minimization, and mitigation are required to protect this species at all times during potentially harmful construction activities.	Thank you for your comment. BOEM has been working closely with NMFS to develop a strategy that best protects marine mammals during the proposed construction of the Project and following construction. See Appendix H for mitigation measures and the NMFS Biological Opinion.

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	While BOEM must minimize existing and potential stressors to the North Atlantic right whale, the agency must also address potential impacts to other protected large whale and small cetacean species. It is therefore imperative that BOEM fully account for the consequences of any proposed North Atlantic right whale seasonal restriction on other protected species and evaluate alternative risk reduction strategies sufficiently protective of multiple species. Requiring a robust and scientifically proven near real-time monitoring and mitigation system for North Atlantic right whales and other endangered and protected species for use during impact pile driving and potentially other noise-generating activities would support the development of alternatives.	
BOEM-2022-0071-0242-0034	We are extremely concerned that offshore wind developers are proposing to commence pile driving at night. As the acoustic models for the project demonstrate, impact pile driving generates levels of noise harmful to marine mammals over large distances. The DEIS states that when monitoring at night or in low visibility conditions, protected species observers (PSOs) will monitor for marine mammals and other protected species using night vision goggles with thermal clip-ons, a hand-held spotlight, and/or mounted thermal camera system. However, the efficacy of these technologies is limited to certain distances and particular species or animal groups. For example, reliable detections made via handheld, light-enhancing devices are generally limited to distances of <200 m for cetaceans and <100 m for pinnipeds and sea turtles. Meanwhile, shutdown zones during impact pile driving will be several kilometers in diameter for large	Pile driving at night may be necessary to ensure the Project remains on schedule. Ørsted has recently funded a study looking at the efficacy of night vision devices coupled with other monitoring such as passive acoustic monitoring. Based on this new information, BOEM does not believe that all available technologies have the limitation expressed by the commentor. BOEM and NOAA continue to review the information and develop appropriate mitigation measures should nighttime pile driving occur.

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	whales. Based on the known limitations of currently available night-time monitoring methods and technologies, particularly over distances commensurate with those of the clearance and exclusion zones, it is likely that the detection probability of North Atlantic right whales and other protected species during darkness and periods of poor visibility (i.e., rain, fog, etc.) will be reduced relative to clear visibility conditions. BOEM should also consider that vessels operating at night may be more likely to strike a right whale or other large whale species due to a lack of detectability. It is imperative that no right whale, or other marine mammal species, is present in the applicable Clearance Zone when pile driving starts. BOEM must require that Sunrise Wind initiate pile driving at least 1.5 hours prior to civil sunset in order to maximize monitoring activities during hours of optimal visibility/daylight. Impact pile driving started at least 1.5 hours prior to civil sunset during good visibility conditions can then continue after dark, as necessary, providing passive acoustic monitoring and the best available infrared technologies are used to support visual monitoring of the clearance and exclusion zones during periods of darkness (see Attachment 1). BOEM should also clarify if detection of a sea turtle will delay the start of pile driving or trigger a shutdown and, if so, what the size of pre-start Clearance and Shutdown Zones are for these species.	

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BOEM-2022-0071-0242-0036	As noted, underwater noise pollution has deleterious consequences for most marine life and represents a significant stressor to marine mammals, including North Atlantic right whales. Without sufficient avoidance and minimization measures in place, potentially harmful levels of noise pollution may be generated at each stage of offshore wind development, including pre-construction site assessment and characterization, during construction, and long-term operations. Cumulative noise impacts may also be considerable, particularly in areas where pile driving is taking place simultaneously across adjacent lease areas—a possibility that is increasing in likelihood as projects experience delays and construction windows for different projects overlap—and during operations, where expansive areas of the ocean may experience elevated noise levels that exceed the harassment threshold for right whales and other low frequency hearing cetaceans. Appendix H of the DEIS mentions that the Applicant will employ noise mitigation techniques during all impact pile driving that will attenuate pile driving noise. However, the use of noise attenuation is not anticipated for other noise producing activities. It is important for BOEM to acknowledge that noise generated by these activities (i.e., vibratory pile driving, cofferdam installation, etc.) may disturb marine life, and for the agency to i) monitor noise generated by all construction activities and ii) require noise reduction and attenuation measures if noise levels exceed that which could potentially harm or disturb marine	Thank you for your comment. Other foundation types were considered for alternatives but ultimately eliminated from further analysis (Table 2.2-1). All noise producing activities that can harm marine mammals will have mitigation and monitoring activities associated with them. Please the Section 3.11.5.1.2, *Marine Mammals*, in the EIS and Appendix H for further details.

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	mammals. We have stressed the most effective way to reduce noise during construction is to install quieter foundation types. If pile driving cannot be avoided, we encourage BOEM to work closely with NOAA Fisheries on activities that could lead to greater levels of noise reduction during impact pile driving for future projects, as noise minimizing approaches during discrete phases of development have been identified by experts as the most promising solution to overcoming noise challenges associated with offshore wind development. Such activities may include the development of a noise reduction standard (akin to the German standard for harbor porpoise) that is tailored to protect species of concern in U.S. waters and designed to account for the larger diameter monopiles planned to be installed, as well as other project- and site-specific conditions in the United States. Given that underwater noise pollution negatively affects species across frequency hearing groups, in the pursuance of this standard we encourage BOEM and NOAA Fisheries to consider a hybrid approach, where risk is reduced for low-, mid-, and high frequencies, rather than solely at the low frequencies at which right whales are most vulnerable. A hybrid approach would help support overall marine ecosystem health rather than prioritize a single species or species group (i.e., low-frequency hearing cetaceans).	

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BOEM-2022-0071-0242-0037	To reduce impacts from noise produced by impact pile driving, BOEM proposes to require a minimum of 10 dB (re: 1 µPa2s) reduction of Sound Exposure Level (SEL). This level of noise reduction and attenuation falls below what can now be achieved with best available noise control technology, and we recommend BOEM strengthen its requirements to maximize the level of noise reduction during construction. As described in Bellman et al. (2020) and Bellman et al. (2022), noise reduction levels achieved in Europe through the combined use of two noise abatement systems (NAS; one positioned in the near-field and one in the far-field) have reached a 20 dB (re: 1 µPa2s) reduction in SEL, or greater. A combination of the IHC Noise Mitigation Screen (IHC-NMS) and an optimized big bubble curtain (BBC) has proven among the most effective to date, with a minimum, average, and maximum reduction in sound exposure level (ΔSEL) of 17, 19, and 23 dB, respectively. The deployment of a combination NAS (i.e., two different systems) is considered by those authors to be "state of the art" interms of SEL reduction and is also important for attenuating sound across a range of frequencies and maximizing transmission loss. We recognize that there are differences between the European offshore wind context and that of the U.S., making the direct transference of findings difficult. The monopiles included in the data set examined by Bellman et al. (2020, 2022) were approximately 8 m or less in diameter, compared with the approximately 10 m or greater diameter monopiles planned for the U.S. Larger diameter monopiles generate	Although all sound attenuation systems can have variable effectiveness at different frequencies, there are currently a very limited number of sound attenuation systems that can more effectively target low frequencies. The availability of these systems may limit their use for any particular project. Current requirements under the MMPA and ESA call for the minimum 10 dB reduction of broadband noise levels for all marine mammals, not just mysticetes. BOEM continues to review this issue and support workshops investigating sound attenuation technologies that would more effectively cover all frequencies of interest for a broad variety of wildlife.

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	greater noise levels at the source. The noise reduction standard the NAS were compared against in Europe was also specifically designed to protect harbor porpoises in German waters (i.e., SEL less than or equal to 160 dB (re: 1 µPa2s) at 750 meters from the monopile installation site), and not tailored to the low-frequency cetaceans that are a priority in the U.S. That said, the water depths are, in some cases, comparable across both regions (up to 40 m) and the European findings can be directly applied to the installation of smaller diameter pin-piles in the U.S. The limited evidence that is available from U.S. offshore wind projects also indicate alignment with Bellman et al. (2020, 2022). For example, the limitations of using a single NAS have been demonstrated. Measurements of sound pressure recorded during the installation of an unmitigated and mitigated monopile for the Coastal Virginia Offshore Wind (CVOW) pilot project indicate that a double bubble curtain (i.e., a single NAS) was most effective at higher frequencies (>200 Hz) and did not attenuate sound as effectively at lower frequencies. This indicates that the deployment of a second NAS designed to attenuate noise at lower frequencies would have further reduced noise impacts.	
BOEM-2022-0071-0242-0038	Given these developments, BOEM should require the developer to implement the best commercially available combined NAS technology to achieve the greatest level of noise reduction and attenuation possible, in line with the mitigation hierarchy. Based on the findings of Bellman et al. (2020, 2022), which indicate a reduction of 20 dB SEL is feasible for monopiles 8 meters in diameter, we recommend	Most of the available sound attenuation systems have a greater effectiveness than a 10 dB reduction. However, many variables effect to performance of these systems on any given day. In BOEM's best judgement after review of the best available information, it is reasonable to expect at least a 10 dB reduction of these systems although better performance can be expected. As stated, the performance will be variable

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	that the minimum requirement of a 10 dB (re: 1 µPa2s) reduction of SEL be viewed as a floor only. BOEM should require developers to deploy technologies proven in Europe to be capable of a 15 dB (re: 1 µPa2s) reduction in SEL, or greater. The noise reduction requirement should apply to all aspects of pile driving operations, including pile strikes, compressors, and operations vessels engaged in construction. Field measurements must be conducted on the first pile installed and data must be collected from a random sample of piles throughout the construction period. We do not support field testing using unmitigated piles. Sound source validation reports of field measurements must be evaluated by both BOEM and NOAA Fisheries prior to additional piles being installed and be made publicly available. As offshore wind rapidly advances in the U.S., more stringent noise reduction requirements will form an important means of reducing the cumulative impacts on species and ecosystems that the industry poses. It would also be beneficial at the project-level by reducing the size of necessary monitoring areas and increasing the probability that a protected species is detected prior to the start of pile driving activity (see, also, Section II.C.3). Additionally, a wealth of research exists which details the impacts of continuous noise on marine life, and the importance of reducing this impact. Best available scientific information indicates that, during the operation phase,	and thus a minimum 10 dB reduction. BOEM will continue to review new sound source verification data that will be submitted with every project and may revise the minimum requirements as the data supports the minimum performance metrics of the systems that can be expected.

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	offshore wind turbines may generate noise audible and potentially impactful to large whales and other marine species over significant distances. Understanding levels and impacts of operational noise is an immediate research and monitoring priority as the first offshore wind projects are constructed in the United States. Pending further study, we recommend the use of direct drive turbines as opposed to turbines with a gear box. Direct drive turbines may emit lower noise levels and reduce risk of behavioral disturbance or habitat displacement of North Atlantic right whales and other marine mammal species, and also reduce impacts to key marine mammal prey species, during the operation phase of development.	
BOEM-2022-0071-0242-0041	Unexploded ordnance (UXO) may be encountered on the seabed in the process of developing the Project in the lease area and/or along the export cable routes. UXOs may require removal through explosive detonation, which could cause disturbance and injury to marine mammals and sea turtles. BOEM describes both vessel based and aerial based monitoring during UXO detonations. BOEM intends to employ reticle binoculars for aerial observations and we do not believe these will be effective for visual observations from the plane. Instead, observers should use inclinometers to record the angle of the sighting from the plane and then calculate the distance of the sighting from the plane. In addition to requiring two dedicated visual observers, a data recorder will also be necessary on the plane, especially if Mysticetus software is employed. This is especially important given that fast flight speeds will make it impossible for PSOs	BOEM will take this comment under advisement with NOAA Fisheries for potential inclusion in the MMPA LOA requirements.

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	to adequately observe the water and enter data simultaneously.	
BOEM-2022-0071-0242-0042	Entanglement in abandoned fishing gear contributes significantly to mortality and serious injury of marine mammals and sea turtles, particularly the North Atlantic right whale. In fact, the mortality due to fishing gear entanglement may actually be higher than estimated due to cryptic mortality. We encourage BOEM and the developer to create a marine debris mitigation plan in addition to the requirement that vessel operators, employees, and contractors complete marine debris awareness training as required by the NMFS Biological Assessment.	Abandoned gear is an issue that agencies overseeing commercial fishing activities should address. BOEM does propose to require monitoring of WTG foundations to better characterize the potential role foundations may play in aggregating/snagging fishing gear that is unrelated to the Project. BOEM and BSEE have additional requirements on marine debris and reporting that is directly relevant to industry activities.
BOEM-2022-0071-0242-0047	We further suggest transparent discussion of areas where estimates of minimal risk are based on limited information or high uncertainty. This includes low frequency sound (infrasound) generated during turbine operations, which could potentially interfere with birds' navigation. While there is limited information available to test or contextualize effects of infrasound on birds, more monitoring is needed. Similarly, the indirect effects from redistribution of forage fish populations following construction are also not discussed. Installation of turbines at Sunrise Wind will likely affect forage fish populations by removing existing hard and soft bottom substrates, and replacing them with vertical structures that act as artificial reefs. Given high uncertainty surrounding effects of these alterations on fish and secondary consequences for avian habitat use and energetics, the potential for such effects (whether positive, negative, or neutral) should be acknowledged and	Thank you for your comment. A Post-construction Avian and Bat Monitoring Framework was developed by Sunrise Wind, and if results indicate bird and bat impacts deviate substantially from the impact analysis included in this EIS, then Sunrise Wind must make recommendations for new mitigation measures or monitoring methods. Additionally, 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" and consideration to the Responsible Offshore Science Alliance (ROSA) Offshore Wind Project Monitoring Framework and Guidelines. For more information on mitigation and monitoring proposed for this Project please see Appendix H.

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	incorporated into adaptive monitoring frameworks.	
BOEM-2022-0071-0242-0050	The Sunrise Wind COP monitoring framework contains notable gaps that will limit its ability to fully detect avian impacts at this project, namely: • It does not fully measure nocturnal traffic. Acoustic sensors can identify species passing through the turbine area but cannot reliably count large flocks, identify migrating birds that do not call in-flight, or separate species with similar calls. Integrating acoustic data with camera technologies and/or radar systems is required to fully measure migrant traffic and identify all species, as well as providing valuable supplementary data on number of individuals, flight speed, and flight height. • It does not address micro-scale collision or avoidance. Although collision monitoring is key to assessing direct effects of wind turbines, collision detection of birds with turbines is limited to opportunistic carcass surveys on platforms and vessels. Such surveys would fail to record any (and very likely most) bird strikes in which carcasses do not land on a fixed or floating structure. Provision for an automated, multi-sensory monitoring system will better enhance understanding of avian and bat activity by tracking micro-avoidance or -attraction behaviors, gauging species composition at the Project site (both diurnally and nocturnally), and detecting movement flux rates for individual aerial wildlife through at least some portion of the project	Thank you for your comment. BOEM and Sunrise Wind will continue to work on the Post-construction Avian and Bat Monitoring Framework if the Project is approved for development.

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	site. • It limits individual tracking to ESA-listed species. There are many important reasons to track non-listed avian species. In cases where welfare concerns or rarity preclude tracking of listed species, non-listed substitutes may be required (e.g., Common Terns for Roseate Terns). Some marine bird species that are globally threatened or endangered under the International Union for Conservation of Nature Red List are not listed under the ESA because of listing delays or because they breed elsewhere. Regardless of listing status, species with high vulnerability to offshore wind or with uncertain population trends should be included in Motus studies to better measure migratory connectivity and determine appropriate locations for population monitoring. • It does not identify acceptable levels of mortality, or displacement, or describe potential mitigation activities that could offset such impacts. The monitoring framework for offshore birds does not directly address the mitigation actions that would be taken for any observed collision or displacement effects, what level of observed impact would trigger such measures, or the kind of habitat and/or resource equivalency analysis that would be implemented for computing the offsets used for restoration.	

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BOEM-2022-0071-0242-0051	We recommend the following changes to Sunrise Wind's monitoring framework for birds: 1. Add visual camera and thermal/infrared camera systems at substations and selected turbines. This will improve detection and identification of nocturnal migrants and help estimate collision rates and avoidance behaviors. Incorporating multiple sensor types, or using available integrated monitoring systems that combine acoustic detection with visual camera technologies, thermographic imaging, and VHF detection,164 would be a much more appropriate system to collect the information sought. 2. Prioritize GPS tracking rather than Motus tracking wherever possible. Currently, satellite uploading GPS transmitters weighing 4 g are commercially available, meaning that any individual bird or bat weighing ≥133 g could be tracked using GPS without exceeding the accepted 3% body mass threshold for ideal transmitter weight. This number will likely decrease over time, as transmitters weighing 1 g (suitable for a 33 g animal) are currently in development. 3. Consider adding focal, non-ESA listed bird species for a cross-project tracking study to detect whether and how avoidance, attraction, collision risk, and/or displacement may occur around the Project Area and adjacent lease areas. Selection of such a species can rely on the results of either project site surveys in aggregate or the MDAT data,	Thank you for your comment, BOEM will take these recommendations under consideration.

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	preferably both, that identify those species that are most widespread across all three wind farms (Sunrise, South Fork, and Revolution Wind Farms). A cross-project tracking study could also build on previous studies that have identified the most susceptible species of marine birds. 4. Minimize acoustic disturbance from construction and operations on diving marine birds. One means to accomplish this objective is to co-place seabird observers with marine mammal PSOs during pertinent acoustic disturbance activities and monitoring periods. However, underwater acoustic disturbance to diving marine birds would be obviated if all pile-driving and other noisy activities are scheduled largely outside the winter and early spring months (November-April) when few or no such diving species would be present in the wind farm area.	
BOEM-2022-0071-0242-0052	5. Expand monitoring of avian displacement to include detecting avoidance at individual wind turbines across relevant spatial scales. Meso- and macro-scale displacement can be studied with high-definition digital aerial surveys using established protocols and accepted survey designs. We recommend that project study areas should include a minimum buffer of at least 20 km around the lease and construction areas and that aerial transects should be spaced 3 km apart, cover the entire study area, with at least 10% spatial coverage of the combined lease and buffer areas. To the extent possible, surveys should be repeated three times within each sampling window, with windows scattered throughout the year, including during each of four seasons.	Thank you for your comment. Sunrise Wind has developed a Post-construction Avian and Bat Monitoring Framework and would engage with federal and state agencies and eNGOs to identify appropriate monitoring options and technologies, and to facilitate acceptance of the final plan. Please see Appendix H for proposed mitigation and monitoring measures for Birds.

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	Survey protocols should be repeated for consecutive years before and after construction, covering a minimum of two years pre-construction, and two years postconstruction. Survey intervals should be spaced sufficiently to be approximately statistically independent (e.g., 3-5 days apart). Data analysis should account for differences in detection probability based on species, flight height, and environmental factors and models. Micro-scale displacement should be studied with automated, remote instrumentation that quantifies continuous bird flux at risk height, but also, where feasible, detect and record the approach distances, directional changes, and collision impacts of individual birds. 6. Include a reasonable requirement for timely data reporting (e.g., all data collected during monitoring efforts must be made available within a year after collection). This practice will ensure that monitoring data are in the public domain to be accessed by researchers working on affected species throughout their ranges, thereby enabling rapid integration of findings across multiple offshore wind energy projects to gauge cumulative effects more fully. 7. Describe acceptable levels of impact and specify mitigation to be taken. This activity should include describing: (a) how carcass observations or other collision and displacement monitoring results can be extrapolated to achieve realistic estimates of the mortality within a population-level context, (b) what thresholds (demographic, mortality, etc.) will be used to initiate mitigation activities, (c) what mitigation activities for restoration will be considered to offset the	

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	observed impacts, including why those restoration actions are appropriate for the particular taxa involved, and (d) what measures of success are to be used to confirm restoration management strategies have been successful.	
BOEM-2022-0071-0242-0053	For at least some of the bird species potentially vulnerable to impacts from offshore wind development, conservation measures are feasible to reduce other stressors and therefore the overall risk to the population. Support from the offshore wind industry for such conservation measures could help mitigate impacts from the development of offshore wind. Mitigation activities, such as restoration, that are taken should prioritize species of greatest need. Priorities may include ESA-listed species like Roseate Tern, or species predicted to have the highest likelihood of cumulative impacts due to the extensive footprint of offshore wind development expected in the future along the U.S. East Coast, e.g., sea ducks, loons, grebes, and cormorants. Similarly, avian species with high population, collision, or displacement vulnerability scores would make prime candidates for greater attention in Sunrise Wind's monitoring and/or compensatory mitigation activities. Other programs that may provide example frameworks for an offshore wind wildlife mitigation program may include in-lieu fee wetlands mitigation programs under the federal Clean Water Act, the Natural Resource Damage Assessment and Restoration Program, the Renewable Wind Energy Research Fund, state endangered species mitigation programs such as the Massachusetts Endangered Species Act	Thank you for your comment. Impacts to birds are discussed in Section 3.8., *Birds,* can be found in Appendix H, *Mitigation and Monitoring,* and Sunrise Wind has developed a Post-construction Avian and Bat Monitoring Framework (Appendix P2 of the COP). Additionally, USFWS developed mitigation recommendations based on the Biological Assessment developed for this Project, these mitigations can be found in Table H-2 of Appendix H.

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	(MESA) Conservation and Management Plan permitting process, or the Vermont Act 250 Section 248 Certificate of Public Good process.	
BOEM-2022-0071-0242-0061	Because, as discussed above, pre-construction acoustic activity may not accurately predict postconstruction fatalities for bats, a commitment to post-construction monitoring is critical to yielding a better understanding about how bats interact with offshore wind turbines.	The Avian and Bat Post-Construction Monitoring Framework is included as an attachment to COP Appendix P2 and is publicly available on BOEM's website.
BOEM-2022-0071-0242-0062	Sunrise Wind's proposal for two years of post-construction acoustic monitoring is an excellent first step. We recommend that Sunrise Wind install bat detector stations at nacelle height (rather than on convertor stations, turbine platforms, and/or buoys) so as to detect activity when bats are in the rotor swept zone and more likely at risk for collision. Additionally, BOEM should require that all acoustic data be reported and submitted to NABat and/or the Bat Acoustic Monitoring Portal, Bat AMP.	The Avian and Bat Post-Construction Monitoring Framework, which is included as an attachment to COP Appendix P2 and is publicly available on BOEM's website. Additional mitigation and monitoring measures may arise from consultations and coordination with federal and state resource agencies. These additional monitoring requirements would be considered by decision makers and incorporated into the terms and conditions for COP approval.
BOEM-2022-0071-0242-0063	We are excited to see Sunrise Wind proposing to install and potentially upgrade Motus towers and support radio-tagging of ESA-listed birds. We recommend that Sunrise Wind also support the tagging of bats, which are underrepresented in Motus, to support understanding of bat activity offshore. Additionally, we suggest that BOEM require deployment of Motus towers pre-construction in coordination with the U.S. Fish and Wildlife Service's offshore Motus network, as BOEM is requiring new lessees in both the New York Bight, Carolina Long Bay, and California. We also urge Sunrise Wind to keep Motus towers deployed,	Additional mitigation and monitoring measures may arise from consultations and coordination with federal and state resource agencies. These additional monitoring requirements would be considered by decision makers and incorporated into the terms and conditions for COP approval.

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	active, and maintained for as much of the lifetime of the Project as possible. Data from these towers will not only inform Sunrise Wind's adaptive management but also, as multiple offshore wind projects are developed, provide a long-term network of Motus towers in the offshore environment that can shed much needed light on species' movements offshore. This would also support Sunrise Wind's commendable intention to coordinate their monitoring with efforts with other offshore wind projects in the area.	
BOEM-2022-0071-0242-0064	Sunrise Wind plans to report dead or injured bats found on vessels and project structures. We note that assessing bat fatalities based on carcasses found on vessels and structures is unlikely to provide a meaningful estimate of bat fatalities, as carcasses can fall far from the wind turbine, based on carcass size, wind speed, turbine height, and other factors. BOEM should consult with experts to determine what, if any, inferences about total fatalities can be made from carcasses detected on vessels and project structures. As new technologies become available for monitoring fatalities at offshore wind facilities, such as strike detection technology, BOEM should require Sunrise Wind to commit to deploying these and, if monitoring reveals that impacts to bats are non-negligible, BOEM should require Sunrise Wind to employ minimization strategies and deterrent technologies.	Additional mitigation and monitoring measures may arise from consultations and coordination with federal and state resource agencies. These additional monitoring requirements would be considered by decision makers and incorporated into the terms and conditions for COP approval. Appendix H has been revised to reflect this comment. BOEM will take this comment under advisement if this new technology is proven to be an effective technology for the offshore environment.
BOEM-2022-0071-0242-0065	We strongly support BOEM's proposed measure that Sunrise Wind recommend new mitigation measures or monitoring measures "[i]f the reported post-construction monitoring	BOEM will take this comment under advisement if this new technology is proven to be an effective technology for the offshore environment. The Avian and Bat Post-Construction

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	results bird and bat monitoring results indicate bird and bat impacts deviate substantially from the impact analysis included in this EIS[.]" However, there is a lack of clarity as to what would trigger this adaptive management. The post-construction monitoring for bats that Sunrise Wind has proposed—two years of acoustic monitoring—will provide information on bat activity in the Project Area. It will not, however, provide information on bat collisions, which are potentially the greatest source of impact to bats from offshore wind development. No research or methods are presented to translate bat activity into bat impacts nor are we aware of any methods accepted by subject matter experts to do so. Because the proposed monitoring methods are unlikely to provide estimates of bat collisions from Sunrise Wind's offshore operations but no collision detection technologies are validated and commercially available for use offshore, BOEM should require Sunrise Wind to commit to deploying collision detection technology, once available. Strike detection technology is in development, with one technology to be tested on an offshore wind turbine in 2023. Sunrise Wind should work with agency staff and researchers to determine the appropriate duration of post-construction fatality monitoring using their current proposed methods and for after collision detection systems are installed. The above recommendations should be included in the to-be-developed Avian and Bat Post Construction Monitoring	Monitoring Framework is included as an attachment to the COP as Appendix P2 and is publicly available on BOEM's website.

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	Plan, and this plan should be made publicly available.	
BOEM-2022-0071-0242-0077	The Draft EIS proposes several mitigation and monitoring measures for benthic resources, invertebrates, finfish, and EFH. These include: (1) an anchoring plan; (2) to the extent practicable, siting the Project and SRWEC to avoid and minimize impacts to sensitive habitats, and avoiding such areas during construction; (3) pre-construction, construction, and post-construction monitoring of benthic habitats in the project area; (4) noise attenuation systems during impact pile driving, including the use of a bubble curtain. We generally support these measures and propose several additional measures to reduce impacts to benthic habitats, finfish, and EFH. Under the proposed anchoring plan, Sunrise Wind would develop an anchoring plan to avoid and minimize adverse impacts to complex habitats during project construction and operations. The anchoring plan would delineate areas of complex habitat around each turbine and cable locations, and identify areas restricted from anchoring. BOEM should require Sunrise Wind to conduct such a plan. Sunrise Wind proposes to avoid siting the Project and SRWEC in sensitive habitats to the extent practicable. While Alternative C would reduce impacts to complex benthic habitats, this alternative would still result in construction occurring in complex habitats in some areas. To further reduce impacts, BOEM should require, to the extent practicable, Sunrise Wind to employ micrositing of WTGs and	Sunrise Wind will conduct pre-construction and post-construction monitoring of benthic habitats in the Project Area (Mitigation measure BENTH - 05). To the extent practicable, the SRWF and SRWEC will be sited to avoid and minimize impacts to sensitive habitat (BENTH-06). Sunrise Wind is committed to collaborative science with the commercial and recreational fishing industries prior to, during, and following construction. Fisheries and benthic monitoring studies (Appendices AA1 [Sunrise Wind 2022a] and AA2 [Sunrise Wind 2022b] of the 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 (FISH-04).

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	cables to avoid siting in complex benthic habitats and other sensitive habitat areas, including areas where subaquatic vegetation is present. More generally, BOEM also states that Sunrise Wind is committed to pre-construction, construction and installation, and post-construction monitoring of benthic habitats in the Project Area. The Draft EIS provides few details on these monitoring studies and does not explain whether Sunrise also plans to conduct monitoring studies of EFH, invertebrates, and finfish. BOEM should clarify in the Final EIS that Sunrise Wind must conduct monitoring studies for all these resources. Moreover, at a minimum, BOEM should require Sunrise Wind to conduct the necessary pre-construction, construction, and postconstruction monitoring of benthic habitats and associated flora and fauna to detect any physical changes and impacts to these habitats and species that occur because of construction activities, the presence of WTG structures in the water columns, hydrodynamic effects, and other impacts.	
BOEM-2022-0071-0248-0020	Fisheries Mitigation refers to siting and project design principles specifically adopted to reduce impacts to fishing. It is not satisfied through compliance with standard mandatory health and safety regulations, although these are important. BOEM has effectively pitted one industry against the other. On the one hand you have a historic, sustainably operated industry integral to our nation's food supply with environmental impacts that are well known and well understood and rates favorably in terms of the carbon	Thank you for your comment. Fisheries mitigation will be addressed through various routes including ongoing research, compensation, and protection measures for sensitive species in this Lease Area, like Atlantic cod. BOEM has worked closely with NMFS on the EFH Assessment and this EIS to identify sensitive species and habitats.

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	footprint to produce a pound of protein. On the other you have a new industry with great promise; but unknown impacts. The fishing industry acknowledges the need to reduce our reliance on activities which will negatively impact our climate. But we cannot, nor should we, prioritize one industry over another. As we, and others, have consistently communicated, siting of OSW projects should be a collaborative effort with the primary goal of avoiding impacts. Unfortunately, that has not been an approach utilized and we are being forced to choose between feeding the nation and renewable energy. Early efforts focused on avoiding impacts could have better framed mitigation conversations. Unfortunately, mitigation to the commercial fishing industry is focusing on compensation. Mitigation is not synonymous with compensation.	
BOEM-2022-0071-0248-0021	BOEM's draft analyses recognize the potentially major impacts to fishing, marine mammals, and navigation of the proposed projects and their respective alternatives. Yet, not all mitigation proposals offered by the fishing industry were evaluated as alternatives in the DEISs. These are summarized below; a full discussion is included in prior RODA's scoping comments on these and other projects. Additional modifications in the project areas to preserve fishing access; • Immediate strategies to address impacts to protected resources during the length of the lease so they are ready to be implemented immediately once impacts are detected;	Mitigations for marine mammals are not proposed as alternatives since any proposed mitigation would apply to all alternatives.

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	• Direct and transparent collaboration with the fishing industry on shoreside considerations including port infrastructure, dock usage, and economic impacts or opportunities; • Safe transit areas through the lease areas under consideration and those reasonably foreseeable, analyzed and implemented using a cumulative effects approach; • Adequate, independent processes for gear loss claims; • Adhere to a holistic approach to determining and awarding compensation from economic loss to fishing and fishing businesses; • Improved federal environmental review analysis and clear identification of scientific unknowns; • Require deicing technology and practices; • Perform "micrositing" of turbines and cables with fishermen who know the areas and surrounding ecosystem(s); • Prohibit turbines, foundations, and cables in sensitive habitat including spawning areas and important fishing grounds; • Monitor fisheries impacts for the life of projects and utilize adaptive management; • Resolve impacts to National Marine Fisheries Service (NMFS) fishery-independent surveys; • Ensure that any economic benefits of offshore wind	

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	accrue to the U.S.—not at some undetermined point in the future, but now.	
BOEM-2022-0071-0248-0032	Compensation for Gear Loss and Damage: Compensation for gear loss or damage as a result of interactions with the Project should be assured. Language should be added which allows fishery participants to be compensated for all gear loss and damage resulting from interactions with infrastructure supporting an OSW facility. Exceptions would exist for interactions which are intentional or the result of gross negligence on the part of the vessel operator. There are a number of things outside of the operator's control which could result in interactions with infrastructure and facilities supporting OSW.	APM "CFHFISH-06" indicates that Sunrise Wind would implement Ørsted's corporate policy and procedure to compensate commercial/recreational fishing entities for gear loss as a result of Project activities. This is also outlined in BOEM's draft guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf.
BOEM-2022-0071-0248-0033	Compensation for Lost Fishing Income: BOEM's draft guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf was woefully inadequate in its approach to fisheries compensation. RODA submitted detailed comments outlining those inadequacies and we incorporate those comments by reference.	The Final EIS (Appendix H) outlines different mitigation measures related to compensation for lost fishing income and gear loss, etc., referencing BOEM's draft guidance.
BOEM-2022-0071-0248-0034	Mobile Gear–Friendly Cable Protection Measures: In developing such protection measures, developers must engage with fishery participants in an effort to understand their needs. In particular, bottom tending gear such as surfclam and scallop dredges, bottom-trawl and others should be consulted to mitigate impacts to fleets utilizing that gear type. This may result in preferred orientation of subsea cables and cable protection or other recommendations from operators in the region should they	Thank you for your comment. A mobile gear friendly cable protection measure is included in Appendix H. Additionally, there is a proposed Boulder Relocation Plan measure which includes outreach conducted with mariners. Please see Appendix H for additional details on these mitigation measures.

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	choose to continue fishing in a project area.	
BOEM-2022-0071-0249-0010	According to the Cumulative Historic Resources Visual Effects Analysis, up to 3,618 wind turbines will eventually be present in the visual geographic analysis area and will change the ocean's undeveloped character to an "industrial wind farm environment" with "major adverse impacts on scenic and visual resources." It is concerning, then, to see the lack of minimum guidelines and best practice standards established for offshore wind projects in the United States, especially as they relate to adverse visual impacts upon National Historic Landmarks and historic properties, sites, and districts listed or eligible for listing in the National Register of Historic Places. It is essential to apply consistent criteria to this project and subsequent future sites. Due to the high cultural and historic sensitivity of our clients' ocean-facing historic properties, best practice criteria must be applied. Minimum standards should include: • Requiring the least impactful nighttime lighting, such as ADLS, as a permit condition; • Requiring all windfarms in a specific region to use the same non-reflective paint color, determined to be most effective in minimizing the visual impacts, per specific atmospheric/geographical conditions of the lease sites; • Establishing minimum set-back standards from land, with specific considerations for historic landmarks and areas with tourism-driven economies; • For communities with historical significance, BOEM	BOEM continues to consult with consulting parties and cooperating agencies regarding adverse effects to Historic Properties and the resolution of those effects through the development of comprehensive stipulations subject to review and signature by required signatories as part of the MOA included in Appendix J. Please see Appendix E of the Final EIS for the newest estimate of WTG's proposed for offshore wind construction.

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	should help ensure that local stakeholders receive fair and direct access to any state and federal agencies or resources, which may provide critical regulatory guidance on how best to avoid, minimize, and mitigate the local impacts of offshore windfarms. This support would be provided independent of the Section 106 process, and would, for example, identify and encourage dialogue between communities with their State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP); and • Requiring—to the extent to which harm to historic and cultural resources cannot be avoided or minimized—appropriate project mitigation measures to offset the impacts to communities, such as community benefit agreements, offshore wind mitigation trust funds, or other economic development arrangements, as are standard in the offshore wind industry globally. At this critical juncture in the development of the U.S. offshore wind industry, stakeholders are open minded, if not supportive, of a successful industry that shares benefits with local communities who will bear the brunt of adverse impacts and certain risk of loss to their economies.	
BOEM-2022-0071-0158-0008	Identify which mitigation measures are assumed for the purpose of impacts determinations	All APMs are considered part of the Proposed Action and alternatives, excluding the No Action Alternative. Other mitigation measures developed during the EIS through comments and consultations are listed in Appendix H and at

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		the end of each resource section in Chapter 3.
BOEM-2022-0071-0158-0035	Mitigation measures are necessary to reduce the potential negative environmental and socioeconomic impacts of the Sunrise Wind project. The recommendations outlined in our offshore wind energy policies, referenced above, should be reflected as terms and conditions for approval of the project. We provided a separate comment letter on the draft Guidelines for Mitigating Impacts to Commercial and Recreational Fisheries. These comments supported many of the mitigation measures recommended in that draft guidance. We recommend that all final mitigation guidelines be reflected in terms and conditions for BOEM's approval of this project. This is especially important given the DEIS only states that "the lessee shall implement a gear loss and damage compensation program consistent with BOEM's draft guidance…" (page H-67). Furthermore, there is reference in Appendix H that Ørsted's corporate policy and procedure will be implemented to compensate for any commercial/recreational fishing entities gear loss, however, this policy is not hyperlinked or provided.	BOEM has reviewed the Council's wind policy referenced and concurs with the content of the document. BOEM also finds that the document is consistent with the approach of the EIS with respect to stakeholder engagement, BMPs, and environmental review considerations (e.g., navigation and safety, evaluation of impacts on fisheries). Therefore, no changes to the EIS are needed.
BOEM-2022-0071-0158-0036	Appendix H includes the analyzed potential mitigation and monitoring measures; however, it is unclear which of these measures are likely to be required by BOEM as opposed to optional. Assumptions about which mitigation measures are required will affect the impact determinations and overall conclusions in the FEIS. For example, time of year restrictions on construction can be used to protect sensitive spawning and fishing periods. This is being proposed for the summer flounder HAPC (page H-10), which the MAFMC designated as	Thank you for your comment. APMs (Table H-1 in Appendix H) are included in the analysis and impact determination for the Proposed Action and alternatives, with the exception of the No Action Alternative. Other mitigation measures proposed by agencies or BOEM are included in Table H-2 to Table H-3 and would include additional mitigations that can further reduce the impacts on resources. These additional measures will be identified for implementation in the Record of Decision. Mitigation and monitoring measures required through permits

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	all native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations. In addition, "time-of-year in-water restrictions to the extent feasible to avoid or minimize impacts to Atlantic sturgeon" are included as mitigation measures (page H-10), though it is not clear what type of monitoring and minimization plans will be put in place. The Councils are supportive of time of year restrictions to reduce potential impacts to sensitive life stages of fishery species, to reduce impacts to fisheries, and to avoid impacts to submerged aquatic vegetation and other structured habitats throughout the project area and cable route. However, further detail should be provided in the FEIS on how this would be done and what exactly these measures would achieve. We recommend working with NOAA Fisheries on impact determinations and identification of sensitive habitats and fishing periods to avoid as ways to mitigate impact.	(Section H.4 in Appendix H) will be required if permits are approved and the Project is approved for development.
BOEM-2022-0071-0158-0038	The Councils are also concerned with the scour protection measures included within the DEIS (e.g., rock placement, mattress protection, sandbags, and stone bags). Per the Council's offshore wind energy policy, we recommend that if scour protection or cable armoring is needed, the materials should be selected based on value to commercial and recreational fish species. Natural materials, or materials that mimic natural habitats, should be used whenever possible. These materials should not be obtained from existing marine habitats and must not be toxic.	Thank you for your comment, a mitigation measure has been included in Appendix H which states, "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

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		scour protection (e.g., concrete mattresses) or veneer to support biotic growth."
BOEM-2022-0071-0158-0039	The DEIS states that the developer will include ways "to mitigate operational impacts on oceanographic high-frequency radars" (page H-51). The fishing industry has proven to be adaptable in the face of change; however, more deliberate mitigation measures that support vessel radar upgrades could minimize impacts to fishermen and others navigating through and around the project area. An adaptation fund is included within the mitigation measures identified in the Empire Wind DEIS. We recommend a similar fund for Sunrise Wind to support vessel radar upgrades and training to help minimize impacts to fisheries and others navigating through and around the project area.	In the revised COP (September 27, 2023), Sunrise Wind added an EPM that confirms that "Sunrise Wind will establish a … Navigation Safety Fund". See Table ES-1, Section 4.7.4.3, and Table 4.9-1. Sunrise Wind provided additional information regarding this fund to BOEM in response to Requests for Interest (RFIs) on July 12, 2023, and May 12, 2023. That information is copied below for reference. Final measures have been incorporated within NYSDOS (received August 24, 2023), Rhode Island Coastal Resources Management Council (received September 7, 2023), and Massachusetts Office of Coastal Zone Management's (received October 6, 2023) Coastal Consistency Determinations. The Rhode Island Coastal Resources Management Council and Massachusetts Office of Coastal Zone Management determinations each include a Navigational Enhancement and Training Program Term Sheet, which outline the Program objectives, approach and eligibility, funding/cap, administration, and redemption process. The New York Determination references a Letter of Intent (LOI) executed by Sunrise Wind and NYSDOS to enter into a Memorandum of Understanding concerning certain proposed mitigation measures. The LOI includes an agreement by Sunrise Wind to contribute to an established Navigational Safety Fund to enable commercial fishermen and for-hire vessels to acquire navigation equipment through a grant or voucher system and provide training and experiential learning opportunities to

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		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 Navigation Enhancement and Training Program. July 12, 2023, Response to RFI: A Navigational Safety Fund will be established within 30 days of receipt of all final federal, state, and local permits, authorizations, concurrences, and approvals necessary to construction and operate the Sunrise Wind Project and will exist until funds run out. The Navigational Safety Fund will enable eligible commercial fishermen and for-hire vessels to acquire navigation equipment through a voucher system and will also provide training and experimental learning opportunities to those navigating within Ørsted/Eversource's Lease Areas off the coast of Rhode Island and Massachusetts. The Navigational Safety Fund was described in a RFI response provided on May 12, 2023 and will be similar to and carry out the same intent as the program established for South Fork Wind (see Sunrise Wind's Rhode Island Federal Consistency Decision, pg. 727) and Revolution Wind (see Revolution Wind's Rhode Island Federal Consistency Decision, pg. 200). May 12, 2023, Response to RFI: The Navigational Safety Fund will be in place 30 days after the receipt of all final federal, state and local permits, authorizations, concurrences, and approvals necessary to

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		construct and operate Sunrise Wind as described in the approved COP and will exist until funds run out. The Navigational Safety Fund will enable eligible commercial fishermen and for-hire vessels to acquire navigation equipment through a voucher system. The Navigational Safety Fund will be similar to and carry out the same intent as the program established for South Fork Wind. It will also provide training and experiential learning opportunities to those navigating within Ørsted/Eversource's lease areas off the coast of Rhode Island and Massachusetts. Fishermen eligible for the Rhode Island and Massachusetts Direct Compensation Programs and who do not already possess AIS transceivers and/or pulse compression radar systems may receive one-time grants for up to $10,000 in order to upgrade or purchase pulse compression radar or AIS. Commercial fishing vessels and inspected for-hire/party vessels will be eligible for $10,000 in upgrades and uninspected for-hire vessels will be eligible for $5,000 in upgrades. Eligible fishermen will be issued vouchers to spend at approved vendors for approved products. The process of issuing vouchers, approving vendors, and approving equipment will be managed by a third party which could be the same third-party managing the Direct Compensation Program. In addition to vessel upgrades, there will be an educational component to the Navigational Safety Fund. Those eligible for direct compensation, may attend a professional training of their choice with support up to $1,000 per person. Eligible trainings include but are not limited to a captain's course, license upgrade, radar course, or rules of the road refresher. Like vessel upgrades, a third-party manager will

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		issue vouchers for training and be responsible for approving trainings, trainers, educators, and/or institutions. www.crmc.ri.gov/windenergy/dwsouthfork/SFWF_FedConsistencyDecision_20210701.pdf
BOEM-2022-0071-0158-0040	Unexploded ordnances (UXOs) can be uncovered during site preparation activities. Exposed UXO presents a significant risk to mariners, especially those towing mobile gear that could bring UXO to the surface. Offshore wind project construction activities can uncover UXOs. We recommend that the terms and conditions specify that developers are responsible for the safe disposal of UXO exposed due to construction activities. Our understanding is that some UXOs might be detected via surveys but are not exposed; in such cases, only mariner notification may be sufficient given disposal may present greater risks. Clear, timely, and repeated communication about UXO locations and any changes in the location or status of UXOs is essential and should not rely only on email notifications	Sunrise Wind has addressed UXO/MEC disposal in Appendix H. BOEM cannot require disposal of unexploded ordinances. In the event a confirmed UXO/MEC is discovered, the Lessee coordinates with the USCG to ensure it is published in the next version of the Local Notice to Mariners.

O.6.23. Purpose and Need

Table O-31. Responses to Comments on Purpose and Need

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BOEM-2022-0071-0065-0001	Citizens Campaign for the Environment (CCE) is a 120,000 member, non-profit, non-partisan organization that empowers communities and advocates solutions to protect public health and our environment. CCE strongly supports advancing well-sited, environmentally responsible renewable energy projects and phasing out the use of antiquated fossil fuels on Long Island and throughout New York State. Thank you for the opportunity to comment on this important renewable energy project.	Thank you for your comment.
BOEM-2022-0071-0065-0002	New York State is a leader in the fight against climate change and a national champion for offshore wind, having passed the strongest climate change law in the nation in 2019. The state is working towards achieving mandates of 70% renewable energy by 2030, carbon free electricity by 2040, and a net zero carbon economy by 2050. We cannot achieve these goals, particularly in downstate New York, without also achieving or exceeding our target of 9,000 MW of offshore wind. The Biden administration has announced plans to tackle climate change and put forth a goal of reaching a net-zero carbon economy by 2050. We must work aggressively to support responsibly-sited renewable energy projects like Sunrise Wind to meet these critical state and federal goals. CCE thanks BOEM for moving forward with the EIS and COP for Sunrise Wind.	Thank you for your comment.

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BOEM-2022-0071-0065-0003	New York City and Long Island are on the front lines of climate change. The NYSERDA white paper on the Climate Leadership and Community Protection Act asserts that one major obstacle the state faces to meet our climate change goals is that there is a "tale of two grids." Upstate uses 88% zero-emission resources but only represents 1/3rd of the energy load, while downstate is 2/3rds of the load and 69% fossil fuels. The only way to see a just transition from polluting fossil fuels to renewable energy downstate is by utilizing offshore wind.	Thank you for your comment.
BOEM-2022-0071-0065-0004	To date, New York has selected five offshore wind projects which, if approved, will power over 2 million homes with clean, renewable energy and bring New York nearly halfway to our goal of 9,000 MW of offshore wind. These projects are also kickstarting an "offshore wind-ustry" in the state, which are already slated to create nearly 7,000 jobs in project development, manufacturing, installation, and operations and maintenance, while creating over $12 billion in economic benefits to the state. They will also allow the state to close down antiquated, polluting fossil fuel fired power plants, which will improve air quality in our region and provide $1 billion in health benefits to New Yorkers in vulnerable and frontline communities.	Thank you for your comment.
BOEM-2022-0071-0065-0005	Sunrise Wind will power over half a million homes on Long Island via a cable connection to the Holbrook Substation in Suffolk County. It is imperative that Sunrise Wind and the other projects are completed in an environmentally responsible manner, but it is also	Thank you for your comment.

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	critical that these projects move forward in a timely fashion if we are going to curb the worst impacts of climate change	
BOEM-2022-0071-0065-0006	CCE thanks BOEM for its thorough assessment of impacts to fish, birds and marine species, which should be mitigated to the greatest extent possible. However, the most immediate impact to these species is climate change. The real danger facing our beaches, fisheries, and coastal communities is not a wind farm, it is rising sea levels, ocean acidification, warming waters and extreme weather events.	Thank you for your comment.
BOEM-2022-0071-0065-0007	These events continue to be a significant threat to downstate New York and to adversely impact our estuaries and our coastal communities. The environmental benefits of advancing offshore wind farms to reduce climate impacts needs to be weighed against any potential impacts associated with construction of offshore wind farms. CCE believes that offshore wind is one significant part of the antidote in fighting climate change. We cannot and should not put the antidote on pause while allowing impacts of climate change to intensify. Long Island and New York City are already experiencing the negative ecological and economic impacts of climate change. We need to be at the forefront of the transition to renewable energy and offshore wind development in the US.	Thank you for your comment.
BOEM-2022-0071-0065-0008	The National Ocean and Atmospheric Administration (NOAA) predicts under a worst-case scenario a 6 ft sea level rise will cause most of the barrier islands and Long	Thank you for your comment.

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	Island homes south of Merrick Road (route 27A) to be flooded or under water, with more than 150 municipalities impacted. Homes and infrastructure are already being raised, including roads in Freeport, Lindenhurst, Smithtown, and Southampton, as well as the Shelter Island ferry, while residents in the most vulnerable communities are facing managed retreat and home buyouts. These communities are in an exceptionally vulnerable position to extreme weather events.	
BOEM-2022-0071-0065-0009	Superstorm Sandy destroyed or damaged 95,000 buildings on Long Island and caused $19 billion in damages to New York City. We are experiencing the increasing occurrence of “hundred-year storms” and increased precipitation during rain and snow events, and the problem will only get worse. NOAA predicts that in a worst-case sea level rise scenario, the average high tide in NYC will be 2 feet higher than the storm surge during Superstorm Sandy. Costs of repairing damage from extreme weather events like Superstorm Sandy and Hurricane Irene coupled with the need to raise homes and pay increased flood insurance premiums are impacting struggling homeowners in coastal communities. In addition to major storms, south shore communities are already experiencing “sunny day flooding” due to higher tides. This means on sunny day there is still street flooding and property damage.	Thank you for your comment.
BOEM-2022-0071-0065-0010	Extreme weather events are not our only challenge. Warmer winters coupled with longer, hotter summers are creating more hospitable conditions for invasive	Thank you for your comment.

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	species, deer ticks and mosquitos that carry diseases, and reduced agricultural yields. Increased summer temperatures and more severe heat waves also degrade air quality, increase health care costs, and put lives at risk.	
BOEM-2022-0071-0065-0011	In the U.S., air pollution from burning fossil fuels leads to annual losses of $600 billion and the loss of 230,000 lives. In NYC, approximately 130 residents die each year just from heat waves, with the number expected to rise over the coming century. Both Suffolk County and NYC regularly receive an "F" for air quality by the American Lung Association and experience disproportionately high rates of asthma, heart disease, and other chronic health issues in disadvantaged communities. Transitioning to offshore wind will significantly curb air pollution and provide quantifiable health benefits for New Yorkers. Air pollution reductions from the first 2,400 MW of offshore wind in New York would be valued at roughly $1 billion and would avoid an estimated 100 premature deaths each year.	Thank you for your comment.
BOEM-2022-0071-0065-0012	Ocean acidity has increased 30% since the industrial revolution and there are documented negative impacts to sea scallops, squid, clams, oysters, and other species in the northeast.	Thank you for your comment.
BOEM-2022-0071-0065-0013	The catastrophic lobster die-off in the Long Island Sound is mainly attributed to warmer waters. The native lobster species and its historic maritime industry declined 90%. The industry used to account for tens of millions of dollars annually. The loss of this fishery is not only an economic loss but also means this historic	Thank you for your comment.

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	maritime culture is slipping away.	
BOEM-2022-0071-0065-0014	In our Scoping Comments, CCE urged BOEM to measure the potentially negative impacts of the offshore wind proposal against the impacts of remaining on fossil fuels and the potential climate change impacts that would result from a "No Action" alternative. We thank BOEM for this important inclusion in the DEIS, as the choice is not between wind and nothing, it is between wind and fossil fuels. Some of these findings under the "No Action" alternative are substantial and serve to illustrate that while all energy projects have some negative impacts, the impacts of doing nothing are significant and unacceptable.	Thank you for your comment.
BOEM-2022-0071-0065-0016	CCE also thanks BOEM for evaluating not only the potential adverse environmental impacts, but also the potential benefits including air quality improvements in disadvantaged communities due to decreased fossil fuel pollution, increasing fish habitat due to artificial reef effects, increased foraging for marine birds and marine mammals, and more. CCE urges BOEM to ensure these benefits and the expected climate change impacts under the "No Action" alternative are included in the final EIS.	Thank you for your comment. Beneficial impacts and climate change impacts are evaluated under all alternatives when applicable. An analysis of avoided emissions was included in the Final EIS and added to Section 3.4.9. The benefits of air quality improvements for environmental justice communities are mentioned in Section 3.17.4.2, *Cumulative Impacts of the No Action Alternative, Air Quality* under impact-producing factors. Potential impacts are considered for sea turtles, marine mammals, and sea birds.
BOEM-2022-0071-0065-0017	Sunrise Wind, along with the other previously selected offshore wind farms, will allow us to transition away from antiquated fossil fuel plants and protect coastal communities. If we are going to combat the local impacts of climate change and reduce air pollution in our Long Island and New York City neighborhoods, the DEIS makes it clear we are going to need responsibly-	Thank you for your comment.

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	sited offshore wind farms like Sunrise Wind.	
BOEM-2022-0071-0158-0002	Clarify in the purpose and need section that BOEM is not bound to consider approval only of projects that are large enough to meet existing state energy procurements.	Thank you for your response. BOEM has prepared the Purpose and Need statement in accordance with United States Department of Interior policy.
BOEM-2022-0071-0198-0001	The New Bedford Port Authority ("NBPA") hereby submits these comments in response to the Bureau of Ocean Energy Management's ("BOEM") Request for comments relating to Draft Environmental Impact Statement for the Sunrise Wind Project. The aggressive timeline for offshore wind development in the Atlantic poses challenges for multiple industries and multiple jurisdictions. It is imperative that BOEM takes a holistic approach to the combined development of all projects. Uniformity is critical when reviewing and ruling on construction and operations plans (COP) on any individual development project. The Bureau of Ocean Energy Management's (BOEM's) Renewable Energy Lease Number OCSA 0487, is sited 18.5 statute miles (mi) (16.1 nautical miles [nm], 29.8 kilometers [km]) south of Martha's Vineyard, Massachusetts, and approximately 30 mi (26.1 nm, 48.2 km) east of Montauk, New York (NY). In considering a reasonable range of alternatives for this project, the NBPA continues to promote the responsible development of offshore wind and therefore a "No Action Alternative (Alternative A)" is not a practicable	Thank you for your comment.

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	substitute if we want to achieve the aggressive climate goals laid out by the federal and state governments. On the other hand, as representatives of the most profitable fishing port in the country driving an industry that employs over 7,000 people, we strongly support "Alternative C — Fisheries Habitat Impact Minimization." We are confident in BOEM's process to identify the best alternative under Alternative C (C-1 or C-2).	
BOEM-2022-0071-0198-0004	In summary, as the most profitable fishing port in the country, it is our mission to promote, facilitate, and defend the goals and needs of our commercial fishing community. We also support the development of offshore wind on our coast and have already played a big part in current and future projects, as evidenced by the port hosting the first purpose-built offshore wind terminal in the northeast and leading the nation as the first offshore wind marshalling port. The development of this new industry has the potential to create thousands of local jobs, promote port infrastructure, and go a long way in realizing the Commonwealth and the Nation's climate and renewable energy goals. We have been commenting on the environmental review not only for this project, but the many projects that are currently in the pipeline. Throughout, we continually stress that it is imperative to have a process where all voices are heard so that we shall have the most responsible development of this new industry and ensure that both the commercial fishing and offshore wind sectors thrive for decades to come.	Thank you for your comment.

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	We appreciate to opportunity to provide comments on the EIS for the Sunrise Wind COP and look forward to the continued working relationship we have developed with BOEM and the offshore wind industry to ensure that all affected industries and communities continue to grow and thrive as we undertake this ambitious environmental and economic effort.	
BOEM-2022-0071-0205-0028	Environmental protection is a key requirement under the OCSLA and NEPA and rigorous plans must be in place for offshore wind projects to comply with various state and federal statutes that projects are subject to. Offshore wind energy must be developed in an environmentally responsible manner that avoids, minimizes and mitigates impacts to marine life and ocean users, meaningfully engages stakeholders from the start, and uses the best available science and data to ensure science-based and stakeholder-informed decision making. This includes analysis of cumulative impacts and adaptive management strategies, obtaining all necessary and relevant data and identifying all methodologies and indicating when information is incomplete or unavailable, acknowledging scientific disagreement and data gaps, and evaluating intermediate adverse impacts based on approaches or methods generally accepted in the scientific community. Avoiding sensitive habitat areas, requiring strong measures to protect wildlife throughout each state of the development process, and comprehensive monitoring of wildlife and habitat before, during, and after construction, are all essential for the responsible	Thank you for your comment.

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	development of offshore wind energy. The combination of project alternatives should be chosen that ensures communities, wildlife, and the environment are protected while maximizing the creation of quality, high-paying jobs and economic benefits.	
BOEM-2022-0071-0206-0001	We write to you on behalf of the members of the Business Network for Offshore Wind (the Network) to provide comments on the Sunrise Wind Draft Environmental Impact Statement [BOEM-2022-0071] published in the December 16, 2022 Federal Register. The Network is the largest nonprofit organization solely focused on the development of the offshore wind industry and its supply chain. Since 2013, the Network has brought together business and government, both domestically and internationally, to educate and to prepare companies and small businesses to enter the offshore wind market. The Network uses the voice of its members to educate and support federal, state, and local policies to advance the development of the U.S. offshore wind industry. The Network empowers its members with the education, tools, and connections necessary to participate in this booming industry. The Network commends BOEM on its decade of work bringing the Sunrise Wind project forward and recent advancement of a Draft Environmental Impact Statement as proof of the Biden-Harris Administration's clear interest in advancing the U.S. offshore wind industry. Development of the Sunrise Wind project will	Thank you for your comment.

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	make important contributions towards national and state offshore wind goals and the establishment of a local supply chain.	
BOEM-2022-0071-0206-0002	Advancement of this project is in the declared public interests of the United States and the state of New York. Presidential Executive Order No. 14008, issued on January 27, 2021, states it is the policy of the United States to combat the climate crisis, reduce climate pollution in every sector of the economy, and spur well-paying jobs and economic growth especially through the development of clean energy technologies and infrastructure. Furthermore, the executive order specifically calls on the Secretary of the Interior to review permitting processes in offshore waters to increase renewable energy production in those waters, with the goal increasing offshore wind power in the United States to 30 GW and creating good jobs. The project is designed to contribute to New York's offshore wind energy goal. The Sunrise Wind farm is expected to begin construction soon after BOEM's approval and can begin providing necessary renewable energy to New York. Sunrise Wind is expected to begin commercial operations in late 2025 with a total capacity of up to 1,034 megawatts (MW). Sunrise Wind's annual production will be enough to power approximately 600,000 average New York homes. In addition, Sunrise Wind can play a key role in helping New York meet the state's goals outlined in the 2019 Climate Leadership and Community Projection Act. The project represents a	Thank you for your comment.

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	significant step towards meeting the state's goal of 70% of the state's electricity generated from renewable sources by 2030. Moreover, Sunrise Wind will fulfill 11% of New York's overall offshore wind goal of 9,000 MW by 2035. By moving forward with the approval of the Sunrise Wind and completing the draft environmental impact statement BOEM is driving New York's offshore wind program one step closer to having steel in the water and helping the state meet its clean energy goals. The Network supports BOEM's deliberate consideration and commitment to environmental protection. The Network encourages BOEM to continue moving the Sunrise Wind project forward with the recognition of the enormous environmental and economic benefits the project offers, especially compared to a "No Action" alternative. Net reductions in air pollutant emissions resulting from the Proposed Action are expected to contribute to long term benefits for communities by displacing emissions from fossil fuel generated power plants. Sunrise Wind project as proposed would result in annual avoided emissions in NOx (1,474 tons), SO2 (1,534 tons), VOCs (106 tons), PM2.5 (471 tons), and CO2 (2,592,802 tons) (COP p 4-141)	
BOEM-2022-0071-0206-0003	The Biden Administration has taken significant actions to bring transparency and predictability to the offshore wind leasing and permitting process, including the full federal permitting approval of Vineyard Wind and the issuance of the Record of Decision for South Fork Wind. BOEM and the Department of Interior are already taking	Thank you for your comment.

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	steps to build that long-term pipeline by releasing a longer-term leasing plan Path Forward 2021-2025 for offshore wind leasing in U.S. waters. Just last week, the Department of Interior announced new proposed regulations that would modernize offshore wind processes in order to decrease costs and market uncertainty. In the face of growing global demand, sending clear market signals to attract investment to the U.S. is critical to ensuring U.S. offshore wind deployment goals are met. The Demand for a Domestic Offshore Wind Energy Supply Chain, a report published by NREL, studied the capacity to fulfill the administration's deployment goal of 30 GW by 2030 and found "additional facilities will be required to achieve a fully domestic offshore wind supply chain." This fact takes on increasing importance as the report notes it is "unlikely that international suppliers will have sufficient throughput to support the construction of both European and U.S. offshore wind energy projects." Accordingly, if the U.S. does not develop a robust domestic offshore wind supply chain, surging global demand for offshore wind project components, services, and raw materials could prevent the U.S. from reaching state and federal offshore wind deployment targets. A follow-up report released earlier in 2023 found that the U.S. market would require $6 billion in new investments in factories, ports, vessels, etc., to ensure the nation matches its 30. GW buildout. And up to $22.4 billion to build out a sustainable	

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	domestic supply chain. Encouragingly, actions by the Department of Interior are already driving substantial investment decisions. The Network closely tracks the market and found that public and private investors committed $2.2 billion in new funding in 2021, including commitments to develop nine major component facilities that will manufacture the foundations, towers, cables and blades of offshore wind turbines. In 2022, the market generated $5.44 billion in new lease revenues for the U.S. government, reflecting an increased investor confidence in the U.S. market which will be crucial to a full build-out of the U.S. industry. Advancing Sunrise Wind is crucial to maintaining this momentum.	
BOEM-2022-0071-0206-0004	The global offshore wind industry is growing exponentially, which will further strain global supply chains. In 2021, market analysts predicted global offshore wind capacity would reach 270 GW by 2030, in line with Network calculations of 254 GW by 2030. With only 57.2 GW installed by the end of 2021 (after 30 years of offshore wind development) the global market was facing a steep installation curve in order to reach Netherlands and Germany agreed to increase their offshore wind capacity “fourfold” by 2030 – equating to 50 GW of new capacity in nations with only 15 GW currently installed. British Prime Minister Boris Johnson called for increasing his nation’s targets to 50 GW by 2030, a 25% increase over current targets. According to Renewable UK, the global pipeline of offshore wind	Thank you for your comment.

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	demand doubled in a year. Actions that delay project timelines must be avoided to the greatest extent possible. Project investments are ongoing and demand for materials, skilled labor, and critical equipment is dependent upon timely implementation. The Network urges BOEM to advance the Sunrise Wind project on its timeline.	
BOEM-2022-0071-0206-0005	In building out offshore wind in the U.S., Sunrise Wind project developer Orsted has invested $2 billion into the U.S. economy and has a supply chain touching upon 41 sates. (See https://us.orsted.com/our-impact/supply-chain) The proposed project is already directly contributing to the formation of a U.S. supply chain, and major investments are dependent on its advancement. The port investment alone will have substantial impacts on redevelopment efforts in two different regions in New York as well as in the State of Connecticut. Construction and operation of Sunrise Wind will create more than 800 direct jobs and over 1200 indirect jobs in New York. Construction and operation of Sunrise Wind will result in direct investment of more than $400M in New York state. To bolster their commitment to the project, Sunrise Wind is providing $10 million to launch a national offshore wind training center at Suffolk Community College and $5 million for a research and development partnership with Stony Brook University. As part of the project a steel fabricator in Western New	Thank you for your comment.

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	York will fabricating anode cages to create at least 100 jobs. The anodes will be assembled with foundation components in the Capital Region, seeding a supply chain that can continue to serve additional offshore wind project creating 230 jobs at Port of Coeymans. Orsted/Eversource is creating an operations and maintenance (O&M) hub at Port Jefferson that will be the home port of a Service Operation Vessel that will support maintenance and operation of the developers' portfolio of projects in the northeast. Because of the size of this project, in addition to the two ports mentioned above, Orsted/Eversource and the federal government are investing $255 million into the Port of New London to develop it as a staging and assembly port and a $90 million investment at the Port of Davisville-Quonset to be used for operations and maintenance. The Sunrise Wind project is also supporting the building of the first US-built service operations vessel (SOV) and 5 crew transfer vessels; the SOV will be built by Edison Chouset's shipyards in Louisiana, Mississippi and Florida, and supplies for the vessel will be sourced in 12 states. In addition, the company has entered into a charter agreement to use the first Jones Act qualified wind turbine installation vessel, the Charybdis, a $550 million vessel being constructed in Brownsville, Texas. Additionally, the New York workforce and more broadly domestic workers will gain entry into the offshore wind workforce and receive invaluable experience to be applied in future projects.	

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BOEM-2022-0071-0206-0006	The Network begins by commending BOEM for recognizing the importance of state public policy by maintaining a commitment to achieve up to 1,034 MW with 94 WTG, delivering clean power to New York. While the Network appreciates environmental and fishing deconflicting considerations undertaken during the process including impacts to complex fish habitats, it is clear that pursuing either Alternative C1 or C2 do not offer significant benefits over Alterative B and could lead to unneeded project delays as shown in the analysis. The DEIS notes the fishing activity in the Lease Area accounts for a very small percentage (0.16 percent) of the total revenue across all fisheries covered by a Fishery Management Plan in the Mid-Atlantic and New England region. The DEIS notes that 75% of commercial vessels fishing the lease area derived less than 1% of their total annual revenue from the lease area, an incredibly low number. (DEIS 3-412). This is demonstrated by the fact that there is no change in impact to commercial and forhire recreational fisheries when comparing the proposed Action to the two alternatives C-1 and C-2. (ES-xi). We emphasize the importance of maximizing the capacity to deliver energy from the project in order to achieve present and future commitments while reducing costs, amplifying community benefits and safeguarding the environment. Furthermore, the Network encourages BOEM to think about holistic economic and environmental impacts when considering alternatives. The Network recommends that BOEM implement the	Thank you for your comment.

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	goals of Alternative B, while recognizing, based on the valuable input that BOEM has received during the process, there may be ways to improve upon the project while ensuring the timeline continues to move forward without delay.	
BOEM-2022-0071-0206-0007	The Business Network for Offshore Wind and its members strongly encourage BOEM to maximize the ability of the lease area to generate and transmit as much electricity as possible to support the national and state of New York goals for renewable energy delivered to the grid. According to the Biden Administration, "More opportunities are ahead, including an estimated $109 billion revenue opportunity across the offshore wind supply chain this decade, and East Coast Governors are laying the groundwork to seize them. Having already set commitments to procure nearly 40 GW of offshore wind, these states are providing a strong demand signal for clean energy that will lower energy costs for American families while protecting them from volatile fossil fuel price spikes." Equally important, the Network urges BOEM to focus on avoiding delay in project implementation that could threaten already challenged supply lines and postpone needed employment. These employment opportunities will directly benefit the residents in the region in which the project is proposed. BOEM noted that "there will be notable and measurable benefits to employment, economic output, infrastructure improvements, and community services, especially job training, because of	Thank you for your comment.

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	offshore wind development." The air quality and other environmental benefits resulting from expanding renewable energy resources cannot wait. The impacts of Sunrise Wind's current design are materially no different than the alternatives analyzed in the DEIS. The Network strongly recommends moving forward with the proposed action in the DEIS and approval of Sunrise Wind's COP.	
BOEM-2022-0071-0229-0004	BOEM's Purpose and Need for the proposed Project is convoluted and restrains meaningful NEPA review, as well as OCSLA compliance. BOEM's purpose and need section focuses exclusively on Sunrise Wind's goal to install a 1,034 MW facility, satisfying Sunrise Wind's "obligation" to NYSERDA for providing 924 MW of offshore wind energy, the Administration's goal to deploy 30 GW of offshore wind by 2030, and consideration of the goals of the applicant (which of course will be to build the full potential of the entire lease area). First of all, Sunrise Wind's "obligation" to NYSERDA was a speculative contract entered into prior to any federal review of the proposed Project and cannot bind BOEM's analysis. BOEM cannot subjugate its NEPA and OSCLA duties to a speculative contract signed by the developer. It is BOEM's duty to analyze various Alternatives and comply with OSCLA standards, not to comply with the developer's and NYSERDA's speculative contracts or "obligation". Otherwise, and as is detailed in the analysis of the DEIS regarding Alternatives considered but rejected and the limits of its analysis,	Alternative C3 has been added, which looks at developing only what is necessary to meet the contracted goals with NYSERDA and not building out the entire Lease Area.

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	BOEM itself has become party to that contract, which is wholly inappropriate and illegal. BOEM's responsibilities as a government agency do not change regardless of private speculation. If a homeowner in a town signed a contract with a carpenter to build a 12x12 foot shed in their backyard prior to applying for a town permit for the shed, and if upon reviewing the application the town ruled that according to its permitting rules that the homeowner could only be authorized to build a 10x10 foot shed, the speculative contract of the homeowner and the carpenter would have to be adjusted to fit the town's permitting requirements, not the other way around. Otherwise the town would be abandoning its permitting rules and procedures in order to fulfill a private contract. A private contract that was created outside the realm of any town rules and regulations and based on pure speculation. It is no different here.	
BOEM-2022-0071-0232-0001	The DEIS cites the Executive Order 14008 to justify the purpose and need of the project. This order specifically includes the necessity to tackle the climate crisis both at home and abroad. The DEIS does not comply with this executive order because it fails to consider the global (abroad) ramifications of the project. a. Climate change is a global, not a local problem. No DEIS should ignore the global environmental costs of a project. This DEIS fails to consider emissions from abroad, including the manufacturing, transportation, concrete production (Miller, 2020), and mining that will occur outside of the local region for the project. Given the executive order's specific inclusion of "abroad," the	BOEM has authority under the Outer Continental Shelf Lands Act (OCSLA) to authorize renewable energy activities on the OCS. The purpose of BOEM's action is to determine whether to approve, approve with modifications, or disapprove Sunrise Wind's COP, not to regulate global climate change. The construction and operation of offshore wind projects will produce air and GHG emissions. Life cycle assessments for renewable energy are an area of ongoing research and investigation. Life cycle assessments for wind energy have shown that these emissions remain significantly lower than the GHG emissions from fossil fuel energy generation (e.g., NREL 2021,

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	DEIS cannot ignore the emissions from these operations or the environmental costs of these activities. b. The DEIS assumes the wind energy generated over the lifespan of the project will "likely" offset the carbon emissions resulting from construction, installation, maintenance, and operations. Analysis of real-world data does not support this assumption. Studies demonstrate that wind-generated energy replaces less than one-tenth the amount of fossilfuel-generated electricity (Jorgensen, 2012; York, 2012). The real-world replacement value of wind energy for fossil-fuel-generated electricity undermines the assumption that this project will mitigate climate change. If BOEM uses a 10% or less replacement value and includes foreign as well as domestic carbon emissions and environmental damage, the project would likely add more to the climate problem than detract from it. This lack of climate change mitigation invalidates all of DEIS's subsequent environmental assessments that assume a net positive effect on GHG emissions.	https://www.nrel.gov/docs/fy21osti/80580.pdf). Sunrise Wind submitted an OCS Air Permit Application which included air dispersion modeling and emission estimates in February 2023. Information from these additional analyses will be included in the Final EIS. In addition, the Final EIS will include estimates of the avoided CO_2 emissions over the lifetime of the Project compared to the alternatives.
BOEM-2022-0071-0232-0003	The statement of purpose adds to the inadequacy of the "no-action" alternative. In the statement of purpose, the DEIS justifies the project based on its ability "to provide a commercially viable offshore wind energy project within the Lease Area to help New York achieve its renewable energy goals (1-8)." Given that NY has mandated an energy transformation, comparing the project to a "no-action" alternative is capricious and invalid.	The No Action Alternative is a viable alternative. New York's energy goal does not mean this Project will move forward.

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BOEM-2022-0071-0232-0034	In sum, BOEM should not approve this project. Sunrise Wind may help NY meets its mandate, but it will not uphold the standards of the Executive Order to preserve biodiversity, promote economic development, protect public health, ensure environmental justice and conserve the marine ecosystem. It will violate both the ESA and the MMPA. Moreover, it does not fulfill the mandate to tackle climate change either locally or globally. BOEM cannot recklessly decide which laws to obey and which to ignore, just because of a misguided desire to help climate change. A united effort will only work within the limits of the law. Furthermore, a mark of a civilized state depends on the degree to which the state protects the poorest, most vulnerable members of society, even if those members are marine mammals, endangered eagles, or threatened birds	Thank you for your comment.
BOEM-2022-0071-0232-0035	This DEIS does not fulfill the executive order, 40018. But, even if it did fulfill the goal of the order, it cannot do so without violating the law of the land. Overriding the MMPA and the ESA to achieve the executive order represents an unacceptable expansion of executive powers. Perhaps this makes sense to BOEM in light of the climate crisis. But, what happens when the next President wants to cut through the same red tape, and override the same laws, but for a different agenda? What then? We, as a country, cannot afford to have a short memory. We need to remember that executive power, in the hands of the wrong person, can use the same precedents, but for different aims. BOEM's decision could have long-reaching negative impacts on	Thank you for your comment. The EIS will not override the MMPA or the ESA. Consultation documents with the USFWS and NMFS have been developed and BOEM is working closely with these agencies to reduce or eliminate impacts on species of concern.

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	our democracy as well as our environment.	
BOEM-2022-0071-0242-0001	On behalf of the National Wildlife Federation, Natural Resources Defense Council, Conservation Law Foundation, National Audubon Society, All Our Energy, American Bird Conservancy, Audubon New York, Connecticut Audubon, Mass Audubon, Nassau Hiking & Outdoor Club, New Jersey Audubon, NY4WHALES, Ocean Conservation Research, Save the Sound, South Shore Audubon Society, Surfrider Foundation, and our millions of members and supporters, we submit these comments on the draft Environmental Impact Statement (DEIS or Draft EIS) by the Bureau of Ocean Energy Management (BOEM) for the Construction and Operations Plan (COP) produced by Sunrise Wind, LLC for the construction and operation of a wind energy facility offshore of New York, Massachusetts, and Rhode Island (the Project, Sunrise Wind). Climate change poses a global threat, with impacts to the United States as a whole, as well as to individual states and local communities. Actions to advance clean renewable energy are necessary to avoid the worst impacts of climate change on communities and wildlife. The Biden-Harris Administration has set a goal to deploy 30 gigawatts (GW) of offshore wind by 2030; New York State, which is the offtaker for Sunrise Wind's electricity, plans to procure 9,000 megawatts (MW) of offshore wind by 2035 and currently has five projects in various stages of development totaling 4,300 MW. In February, New York held a record setting lease sale of six leases in	Thank you for your comment.

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	the New York Bight garnering $4.37 billion.2 Our organizations support these national and state offshore wind goals and actions and recognize the role that Sunrise Wind will play in bringing 1,034 MW of clean renewable energy to New York. Collectively, we advocate for policies and actions to bring offshore wind to scale in an environmentally protective manner and believe that permitting Sunrise Wind offers a critical opportunity to set a high standard for project development and environmental review. Responsible development of offshore wind energy: (i) avoids, minimizes, mitigates, and monitors adverse impacts on wildlife and habitats, (ii) minimizes negative impacts on other ocean uses, (iii) includes robust consultation with Native American tribes and communities, (iv) meaningfully engages state and local governments and stakeholders from the outset, (v) includes comprehensive efforts to avoid impacts to underserved communities, and (vi) uses the best available scientific and technological data to ensure science-based stakeholder-informed decision making.	
BOEM-2022-0071-0242-0002	The Project will be a commercial scale wind facility consisting of up to 94, 11-MW turbines, an offshore open loop cooling converter station (OCS-DC), interarray cables, an onshore converter station (OnCSDC), an offshore transmission cable, and an onshore interconnection cable. If the COP is approved, Sunrise Wind would help the	Thank you for your comment.

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	state of New York to achieve not only its aforementioned offshore wind goal, but also the equally ambitious goal to generate 70 percent of electricity from renewable resources by 2030. While the Project will provide significant benefits to New York, it is also important to address the potential negative impacts to the unique habitats and wildlife of the state of New York, the New York Bight, as well as to the habitats in the Southern New England Region of the Atlantic Outer Continental Shelf (OCS). All offshore wind activities should proceed with strong protections in place for habitats and wildlife, using science-based measures to avoid, minimize, mitigate, and monitor impacts on valuable and vulnerable wildlife and ecosystems. We submit the following comments to guide BOEM in meeting its obligations under the National Environmental Policy Act (NEPA) in finalizing its EIS for Sunrise Wind.	
BOEM-2022-0071-0242-0079	Our review of the Sunrise Wind Draft EIS and recommendations are focused on the responsible advancement of the offshore wind industry as a critical component of combating climate change. Our comments serve to collaborate with the agency to employ scientifically sound, productive and protective measures to avoid, minimize, mitigate, and monitor impacts of offshore wind on wildlife and habitat. We thank BOEM for their consideration of our comments and for their efforts to meet the clean energy needs of the people of New York.	Thank you for your comment.

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BOEM-2022-0071-0248-0024	In prior comment letters, we have been critical of the lack of information provided in previous DEIS. We appreciate these DEISs providing some of the information we have requested in those letters. For example, CVOW intends to utilize 14MW to 16MW turbines while Sunrise proposes 11MW. We recommend an alternative be added to the Sunrise DEIS that considers utilization of turbines like those proposed in CVOW, making the geographic footprint, in terms of WTGs deployed, smaller. This, in turn, could assist in the avoidance and/or minimization of impacts resulting from the project. This alternative should be considered and made clear to the public as turbine size is fundamental to the number of turbines that will be used in a project area.	Thank you for your comment. The only WTGs proposed in the PDE are 11-MW WTGs. Other WTG sizes were considered but eliminated for consideration, which is described in Table 2.1-1.
BOEM-2022-0071-0248-0025	Avoidance is the first step of impact minimization under NEPA. For the fishing industry, avoidance is most readily achieved by constructing the fewest turbines, as turbines will displace fishing activity. Power agreements often drive the number of turbines a developer will use in a lease area, but size also influences how many turbines will be needed. Clearly the developer has an anticipated turbine size they intend to use as the number of turbines and wind farm capacity are stated in Appendix E of the DEISs. Therefore, the turbine size should be easily available in the Executive Summary of the DEIS. Should the developer anticipate using the largest turbines available at the time of construction, this should be clearly stated and a range of anticipated turbine size should still be provided.	WTG size is discussed in the *Executive Summary* under *Alternative B - Proposed Action*, as well as throughout the Final EIS.

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BOEM-2022-0071-0249-0001	The Newport Parties and Block Island Parties have consistently expressed their support for responsible wind energy development and the growing need for sustainable energy sources in Rhode Island as well as the United States. Their aim in consultation with BOEM is to ensure that BOEM's permitting process follows the law, and that BOEM selects an alternative that preserves the integrity of the project's surrounding area to the greatest extent possible. BOEM, however, has a responsibility under federal law to resolve all adverse effects to Newport's and Block Island's historic properties, which include some of the nation's best preserved and highly valued National Historic Landmarks such as the Bellevue Avenue Historic District, Ocean Drive Historic District, The Breakers, Marble House, and Southeast Lighthouse, along with myriad historic properties listed in the National Register of Historic Places such as those on Block Island	Thank you for your comment.

O.6.24. National Environmental Policy Act/Public Involvement Process

Table O-32. Responses to Comments on the National Environmental Policy Act/Public Involvement Process

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BOEM-2022-0071-0147-0001	I have submitted many written comments over the years, attended many public hearings and provided public testimony. During all of which I, and many others, have stressed the need for proper baseline studies to be carried out prior to construction. This has not happened.	Thank you for your comment.
BOEM-2022-0071-0147-0002	We have also advocated for cumulative impacts to be analyzed; this has not happened.	A cumulative impact analysis was included within the Sunrise Wind Draft EIS and Final EIS. Sections 1.6 and 2.1.1 discuss how the cumulative impacts are analyzed.
BOEM-2022-0071-0147-0003	I understand the need for alternative energy, but I do not think it should be rushed and as a result put another ecosystem at risk for its development.	Thank you for your comment.
BOEM-2022-0071-0147-0004	While reading through the different alternative's impacts I noticed that the "No Action" alternative refers to the instance when the Sunrise Wind project isn't built, but the surrounding offshore wind farms are. I think this is deceiving. The "No Action" alternative in all DEIS's should be a true no action, as in no offshore wind construction is approved and carried out and construction is compared to the current non-developed state.	Sections 1.6 and 2.1.1 discuss how the cumulative impacts and the No Action Alternative are analyzed. Only already approved wind farm projects are included in the baseline for the No Action Alternative.
BOEM-2022-0071-0147-0006	At this point I cannot support any of the alternatives listed in this DEIS. I support a true no action until proper baseline studies and cumulative impacts are carried out and analyzed. I truly believe that that is the best path forward for the	The "true no action" for this EIS is that this Project would not be approved to move forward, which is analyzed in this EIS as the No Action Alternative. The No Action Alternative does consider the baseline conditions, which have already permitted projects and other marine resource uses. In addition to this, we analyzed the

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	environment.	cumulative impacts of all the proposed projects being developed in the absence of this Project. Sections 1.6 and 2.1.1 discuss how the cumulative impacts and the No Action Alternative are analyzed.
BOEM-2022-0071-0158-0001	Given the current pace of offshore wind energy development in this region and workload constraints, we are unable to provide a detailed review of this project and the DEIS. For example, this comment period overlaps with comment periods on DEIS documents for three other wind projects in our region as well as BOEM's Renewable Energy Modernization Rule and the Coast Guard's Port Access Route Study for Approaches to Maine, New Hampshire, and Massachusetts. The analysis in the DEIS has important ramifications for terms and conditions which may be implemented through final project approval, including fisheries mitigation and compensation measures. With this in mind, we strongly encourage BOEM to consider the recommendations listed in the wind energy policies adopted by both Councils, which apply across all projects. Our two Councils worked together on and adopted the same wording for these policies. We also urge BOEM to adopt the recommendations provided by NOAA Fisheries for this project, including recommendations regarding data considerations, impacts analysis, and ways to minimize the negative impacts of this project on marine habitats, commercial and recreational fisheries, and fishery species.	Thank you for your comment and we apologize for the difficult commenting period. BOEM is working closely with NOAA fisheries (NMFS) to develop alternatives to reduce impacts on the fisheries' habitats. Your comments and recommendations are considered in this EIS.

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BOEM-2022-0071-0158-0003	Clarify how alternatives can be combined, namely C1 and C2 along with the C-2a through C2d sub-options, and which turbine placements would be removed from consideration under each.	Alternatives can be combined to best reduce impacts during the Record of Decision. The decision maker will use information from the EIS to make the most informed decision when determining which Alternative, or combination of alternatives, to consider.
BOEM-2022-0071-0158-0004	Analyze the impacts of all action alternatives in detail, including Alternatives C1 and C2, not just the no action and proposed action.	All alternatives are analyzed for each resource area; however, since the nature of Alternatives C1 and C2 is to reduce habitat impacts, some resources will not be impacted when compared against the No Action Alternative and Proposed Action. For example, coastal fauna would have no impacts under Alternatives C1 or C2 because no changes to coastal fauna occur under these alternatives. In this scenario, impacts are the same as the Proposed Action, which is stated concisely in the EIS to save the reader time and reduce the page limit instead of rewriting the initial analysis under the Proposed Action.
BOEM-2022-0071-0158-0005	State if impacts are beneficial or adverse.	Impacts are assumed to be adverse unless stated that they are beneficial.
BOEM-2022-0071-0158-0009	The National Environmental Policy Act requires consideration of a range of alternatives which could meet the defined purpose and need for the action. Section 1.2 of the DEIS (Purpose and Need of the Proposed Action) notes that Sunrise Wind can produce up to 1,034 MW of electricity and the project is already obligated to provide 880 MW (up to a maximum of 924 MW) to the state of New York. Each action alternative in the DEIS (i.e., Alternatives B, C-1, and C-2) includes up to 94 wind turbine generators and could produce up to 1,034 MW of electricity. The minimum number of turbines and the minimum total MW of energy generation required to meet the purpose and need	Thank you for your comment. This comment has been addressed under Alternative C-3 by looking at the lower and upper ranges of the NYSERDA agreement (880 MW, 924 MW, and 957 MW). Additionally, language was added to Section 1.2 stating, "BOEM is not bound to consider approval of projects that are only large enough to meet existing state energy procurements".

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	is unclear. This poses challenges for determining which final configurations of the alternatives could meet the purpose and need while reducing the negative environmental and socioeconomic impacts of the project. We are concerned about the implication that only alternatives which would generate the full procured amount of electricity could meet the purpose and need. This interpretation is inconsistent with the purpose and need as written. This could limit BOEM's ability to reduce the potential negative environmental impacts of the project by considering approval of a smaller project than that proposed by the developer. We suggest that Sunrise Wind's FEIS and future DEIS and FEIS documents for other projects more clearly indicate that the agency is not bound to consider approval only of projects that can produce a certain amount of electricity. BOEM should consider federal and state renewable energy targets as well as existing procurements when preparing an EIS and determining whether to approve a project. However, it should be made clear that BOEM can approve a project that is smaller than what was proposed or procured. We suggest expanding on this to make it clear that the project will avoid risks to the health of marine ecosystems, ecologically and economically sustainable fisheries, and ocean habitats. BOEM should clearly acknowledge that if	

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	these risks cannot be avoided, they should be minimized, mitigated, and compensated for.	
BOEM-2022-0071-0158-0034	The FEIS, and all future NEPA documents for other wind projects, should specify if an impact is adverse or beneficial. The DEIS indicates that impacts are adverse unless specified as beneficial. However, some impact producing factors (e.g., presence of structures) are expected have both adverse and beneficial impacts (e.g., adverse for soft bottom species and beneficial for structure-oriented species). The clarity of these descriptions would be improved if “adverse” or “beneficial” were specified for each impact, or, at a minimum, at the beginning of each section. This should be done consistently throughout all sections of the document.	All impacts are assumed adverse unless is it stated that they are beneficial, as stated in Section 2.4 and Section 3.3.
BOEM-2022-0071-0229-0001	BOEM's release of the Sunrise Wind DEIS on December 12, 2022, right before the Christmas holidays, and simultaneously with the Empire Wind DEIS comment period, New England Wind DEIS comment period, Coastal Virginia Offshore Wind DEIS comment period, the state’s RFI for a Regional Administrator for fisheries compensation comment period, two 3- 5 day Mid Atlantic Fishery Management Council meetings, and a 3 day New England Fishery Management Council meeting seems to be designed to prevent meaningful participation of the commercial fishing industry in the BOEM process for all of these projects, including Sunrise Wind. The commercial fishing	Release of the Draft EIS at this time was not designed to prevent meaningful participation from public or consulting parties, we value your input and apologize for the difficult timing.

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	industry does not have an army of staff, as does BOEM, to exclusively focus on each DEIS. Additionally, commenting on offshore wind is not our sole job description. BOEM is fully aware of the dates of the Fishery Management Council meetings, as it attends many of them, including those which occurred during the Sunrise Wind comment period. Meeting fatigue, combined with the fact that there are only so many hours in a day to attempt to read through the thousands of pages of BOEM DEISs and associated documents makes full comments on each DEIS impossible. Therefore, these comments will be significantly abbreviated compared to comments that would be prepared if BOEM allowed more time for comment and/or more spacing between DEIS releases. As the public stakeholders with the most to lose from offshore wind, we request that BOEM extend the public comment period for Sunrise Wind and well as all the other proposed Project DEISs to allow for true public participation in the BOEM process.	
BOEM-2022-0071-0229-0002	The Sunrise Wind DEIS is one of the least detailed of several DEISs that we have reviewed thus far, and lacks a standalone and/or detailed cumulative impacts analysis. Impacts are generalized, very rarely quantified, and those that are quantified are quantified in a general and not specific manner. This makes detailed and specific comment, or weighing of alternatives, impossible. BOEM does not provide enough detailed information to	Thank you for your comment. At this time a supplemental Draft EIS will not be released but your concerns are noted and more detail regarding the cumulative impacts is included in the Final EIS.

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	differentiate between alternatives and associated impact producing factors, leading essentially to conclusions that all impacts are the generally the same. Reality dictates that this is not the case. For example, Table ES-2, "Summary and Comparison of Impacts among Alternatives with No Mitigation Measures" concludes that No Action will have the same impacts to Water Quality as all of the Action Alternatives, despite the proposed Project containing an open cooling water intake system for its offshore converter station (OCS-DC) that would release 8.1 million gallons of 90 degree F effluent on a daily basis. In another example, Table ES-2"Summary and Comparison of Impacts among Alternatives with No Mitigation Measures" concludes that No Action will have the same impacts to Benthic Resources as all Action Alternatives. Pile driving up to 94 turbines into the ocean floor and laying 285 miles of cables creates impacts to benthic resources that would not exist if a developer was not pile driving 94 turbines into the ocean floor and laying 285 miles of cables. BOEM's conclusions make no sense, and result from lack of detailed analysis. Lack of detailed and quantitative analysis makes weighing of Alternatives impossible and all of BOEM's conclusions flawed. We request that BOEM release a supplemental DEIS that contains more finely detailed information and appropriate specific, not generalized, analysis that differentiates between	

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	alternatives.	
BOEM-2022-0071-0229-0003	BOEM continues to conflate the No Action Alternative with a Cumulative Impacts Analysis. This makes comparison of No Action with the Cumulative Impacts Analysis impossible as a practical matter, and the document does not contain any charts, tables, or methodology by which a Cumulative Impacts Analysis was conducted. The No Action Alternative contains "impacts from ongoing activities" as the "baseline against which the direct and indirect impacts of all action alternatives are evaluated", and states that "other reasonably foreseeable future impact-producing offshore wind and non-offshore wind activities would be implemented, which would cause changes to the existing baseline conditions even in the absence of the Proposed Action". This is not a No Action Alternative. This is a Cumulative Impacts Alternative. BOEM cannot create a "baseline" of cumulative impacts. Cumulative impacts are future foreseeable impacts, not current baselines. The document even states this: "The continuation of all other existing and reasonably foreseeable future activities described in Appendix E (Planned Activities Scenario) without the Proposed Action serves as the baseline for the evaluation of cumulative impacts of all alternatives." A true No Action Alternative would contain only existing permitted projects- Vineyard Wind 1 and South	The no action and cumulative analysis are not the same. The no action is only looking at permitted projects as the baseline, while the cumulative impact analysis looks at the possibility of all offshore wind farms becoming permitted. Sections 1.6 and 2.1.1 discuss the how the cumulative impacts and the No Action Alternative are analyzed.

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	Fork Wind Farm- in its analysis. A Cumulative Impacts Alternative would detail all the planned and future foreseeable BOEM actions such as those potential future projects detailed in Appendix E. By equating the two, BOEM serves to downgrade the impacts produced by the proposed Project of Sunrise Wind. This is a corruption of NEPA and must be rewritten and all alternatives re-analyzed, with standalone No Action and Cumulative Impacts Alternatives.	
BOEM-2022-0071-0229-0005	Additionally, rather than comply with its OSCLA duties which state that the Secretary "shall ensure", among other things, "prevention of interference with reasonable uses" when conducting all manner of offshore wind leasing, BOEM has instead substituted "promoting ocean co-use" as its own requirement. This is not the same. "Promoting ocean co-use" is not the same as "shall ensure prevention of interference with reasonable uses." BOEM has taken a simple construct of the English language and changed it to something entirely different. BOEM does not get to dictate its own scope of authority or change the parameters of its own authority; only Congress can do that. As such, BOEM's assumptions in the Purpose and Need section of the DEIS is faulty at its core, and therefore all resulting analysis is faulty.	BOEM intends to comply with its authority under the OCSLA. BOEM's decision will be made after weighing the factors in subsection 8(p)(4) of the OCSLA, which include protection of the environment, conservation of the natural resources of the OCS, and consideration of other uses of the sea or seabed.
BOEM-2022-0071-0229-0006	BOEM states that it will make its determination on the proposed Project "after weighing the factors in subsection 8(p)(4) of OSCLA that are applicable to	Section 8(p) of the OCSLA, its implementing regulations, and Lease OCS-A 0487 require BOEM to analyze Sunrise Wind's proposal to build a commercial-scale wind energy facility on Renewable

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	plan decisions and in consideration of the above goals". OSCLA says nothing about weighing. It says "shall ensure" the factors listed, not in consideration of the developers or state's goals or contractual "obligations", but in the absolute. BOEM shall ensure prevention of interference with reasonable uses. BOEM shall ensure safety. All these obligations that BOEM "shall ensure" are applicable to the plan decisions. That is the point. BOEM does not get to decide which ones are and which ones aren't. The law is supposed to constrain and set parameters on BOEM decision making, giving it limited and not unlimited authority. This is the entire idea of the law. BOEM has the authority to lease for offshore wind, subject to constraints. These legal constraints override Executive Order policy statements, developer contract "obligations" and full buildout goals, and state energy goals. However, it is clear from the Alternatives Considered but Not Analyzed that BOEM constrained its NEPA review and OSCLA compliance based on developer goals of full buildout of 1,034 MW, as well as the actual contract that the developer signed with NYSERDA, rather than fulfilling its OSCLA duties that the law mandates it "shall ensure." It places erosion of developer profits above OSCLA duties. This is a problem and should be investigated as a form of regulatory capture. We discuss this below.	Energy Lease Number OCS-A 0487. BOEM will either approve, disapprove, or approve it with modifications. The EIS's purpose and need reflect the requirements of those regulations. Any changes to BOEM's renewable energy program are outside the scope of this environmental review and will be analyzed through a separate process. BOEM's purpose and need, as stated in Section 1.2, is to determine whether to approve, approve with modifications or disapprove Sunrise Wind's COP, is needed to fulfill BOEM's duties under the lease. BOEM considered reasonable alternatives during the EIS development process to avoid or minimize adverse impacts in accordance with NEPA implementing regulations. Offshore wind projects rely on offtake agreements to obtain upfront financing for the capital costs of constructing a project. Without its existing offtake agreement, Sunrise Wind would not construct its proposed Project, or any of the action alternatives described in the Draft EIS. BOEM finds that the unique position of offtake agreements necessitates more deference than a typical contract between two private for-profit entities. An alternative that fails to meet the main goal of the Applicant would be equivalent to analyzing a No Action Alternative. Therefore, BOEM considers it appropriate under NEPA to analyze alternatives that would allow lessees to meet the obligations under their offtake agreements. Alternative C-3 has been added which looks at the lower and upper ranges of the NYSERDA agreement (880 MW, 924 MW, and 957 MW).

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BOEM-2022-0071-0229-0007	Alternatives Considered but Not Analyzed: The rejection of 4 nm wide transit lanes discussed on page 2-38 of the DEIS focuses on the fact that, "Adding transit corridors could erode Project economics and logistics and potentially lead the lessee to retract from the [Northeast leaseholders 1x1 nm turbine spacing] agreement, to which it committed to assuming that no additional transit lanes would be required". First of all, the developer was part of multiple public transit lane workshops held by RODA prior to secretly releasing their "Northeast leaseholder agreement" in contradiction of the work accomplished at those workshops, which included multiple transit lanes that would have minimally disrupted the Sunrise Wind project. The BOEM rationale for rejecting consideration of this transit lane Alternative, of which radar interference concerns were a driving force, additionally rests on the conclusions of the USCG MARIPARS, which did not evaluate radar interference but erroneously alluded that it did not occur. Since the completion of that document, the National Academes of Science released a report, sponsored by BOEM, that confirms the very real presence of radar interference as a result of offshore wind turbines, with no immediate solutions. That report quotes part of our comments on the MARIPARS, which were ignored and which we have attached along with this comment. These comments also detail the reasoning for the request	As cooperating agencies, BOEM and the USCG have consulted over the course of the NEPA process for the proposed Project as it relates to navigational safety and other aspects. The Final Massachusetts and Rhode Island Port Access Route Study (MARIPARS) evaluated vessel traffic through the lease areas. They recommended all surface structures be aligned in a 1 by 1 nautical mile grid, such that vessels anywhere in the RI and MA lease areas would pass 1 WTG on either side every 1 nautical mile when traveling north-south or east-west. The mere presence of other proposed lanes will likely create conflicting-use scenarios. In response to concerns of increased navigational safety risks due to all transiting traffic being funneled into a navigational safety corridor, the USCG stated that "the standard and uniform [1-nautical-mile] grid pattern… should alleviate… concerns [with compression and funneling traffic through relatively narrow lanes] by providing vessels with sufficient spacing and multiple options to transit safely through the array." If the entire MA/RI WEA is developed consistently with such a grid pattern, mariners could choose among the many resulting navigation safety corridors to safely navigate through the entire MA/RI WEA.

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	of transit lanes as specifically being concerns over radar interference. As a major issue that has gone unaddressed by both the USCG and BOEM, particularly as it pertains to BOEM's requirement that any and all offshore wind leasing activity "shall ensure….safety", BOEM cannot continue to brush this issue aside or use the MARIPARS as a full evaluation of safety in navigation through the lease area. We discuss this further later in our comments.	
BOEM-2022-0071-0229-0008	Another Alternative Considered but Not Analyzed is the Alternative to consider a closed loop cooling system for the OCS-DC. As evidenced in our comments below, we have significant concerns surrounding the OCS-DC open cooling water intake system. BOEM's stated reasons for rejecting any analysis for this option, which would significantly reduce the adverse environmental impacts associated with the proposed Project, is that a closed loop system would be "less energy efficient", cause "significant increases in capital expenditures (CAPEX) and operational expenditures (OPEX)." This is not our problem. This is not BOEM's problem. Analyzing a reasonable range of Alternatives per NEPA is BOEM's problem, not attempting to make the cheapest possible options available to the developer at the expense of the environment. Sunrise Wind is the only project and only developer so far to even propose such an impactful and harmful system. This means that it is unnecessary and is simply a desired design feature on the part of	BOEM's *Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operations Plans, pursuant to NEPA*, published June 22, 2022, is available at this link: https://www.boem.gov/sites/default/files/documents/renewable-energy/BOEM%20COP%20EIS%20Alternatives-2022-06-22.pdf. Screening criteria listed in the document linked above allow for BOEM to dismiss an alternative from further analysis if it is "technically infeasible or impractical, meaning implementation of the alternative is unlikely given past and current practice, technology (e.g., experimental turbine design or foundation type), and/or site conditions (e.g., presence of boulders) as determined and documented by BOEM's technical experts." As indicated in Table 2.2-1 of the Draft EIS, there are no commercially available alternative cooling technologies for use in the offshore marine environment that could be considered an alternative to the Applicant's Proposed Action.

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	the developer. However, BOEM's conclusion is that "For these reasons, consideration of a closed loop cooling system is not technically and economically feasible or practical." Yet BOEM offers no rationale for this statement. If other developers do not need such systems, why would Sunrise Wind? Why would using the same types of systems as other approved projects make Sunrise Wind's proposed Project technically and economically feasible and practical? Where is any analysis to this effect? Who decides what is feasible? Does BOEM conduct any independent consideration of "feasible"? Or does BOEM simply take a developer's statement that it is feasible or unfeasible as its Alternatives analysis? We request that BOEM define its process for determining "feasible" and "practical" for any part of a project, any independent analysis conducted to determine feasibility and/or practicability and how BOEM weighs any such analysis vs potential environmental impacts, including any thresholds utilized, in making "feasibility" or "practicality" determinations. However, the very disturbing trend in BOEM's analysis is the reliance on economics of the developer. BOEM says that considering any Alternative analysis of a 4 nm wide transit lane, which would be in compliance with a mandatory OSCLA legal requirement to provide for safety, "could erode Project economics" and therefore discontinues the discussion. BOEM states that any	

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	alternative to the proposed Project's open cooling water intake system would be "not..economically feasible or practical". The Sunrise Wind project is already unfeasible economically. Orsted has already calculated a 2.5 billion DKK impairment loss on the Sunrise Wind project and before it is even built is discussing future divestment.	
BOEM-2022-0071-0229-0009	BOEM can't base its decision on swings in economics; it has to base its decisions on fulfilling its legal requirements. Many projects are already defaulting on power purchase agreements- another reason that BOEM cannot continue using these PPAs as rationale for not disapproving projects or parts of projects or refusing to consider various Alternatives. Commonwealth Wind has already appealed for a renegotiation of its power purchase agreement with the state of Massachusetts because the proposed project is now uneconomical and unfinanceable. Ocean Wind off the coast of New Jersey, planned by the same developer as Sunrise Wind, has now become so economically unfeasible that PSEG has pulled out of its 25% stake in the project after only 2 years of its initial investment, as its CEO states, "what you have been seeing with others, we are seeing with our projects". Currently, offshore wind projects are failing economically before even being built or reviewed by BOEM. BOEM cannot therefore rely on "economic feasibility" as a decision point for rejection of Alternatives unless it is also prepared to	BOEM's regulations require BOEM to analyze Sunrise Wind's proposal to build a commercial-scale wind energy facility on the Renewable Energy Lease Number OCS-A 0487. The purpose and need in the EIS reflect the requirement per those regulations, whereas BOEM's purpose, as stated in Section 1.2—to determine whether to approve, approve with modifications, or disapprove Sunrise Wind's COP—is needed to fulfill BOEM's duties under the lease. BOEM considered reasonable alternatives during the EIS development process that would avoid or minimize adverse impacts in accordance with NEPA implementing regulations. Under the NEPA regulations at 40 CFR1508.1(z), "reasonable alternatives means a reasonable range of alternatives that are technically and economically feasible, and meet the purpose and need for the proposed action." In the case of Sunrise Wind, an alternative that cannot meet the requirements of the offtake agreement that was awarded on a competitive basis would be economically infeasible. Offshore wind projects rely on offtake agreements to obtain upfront financing for the capital costs of constructing the Project. Without its existing offtake agreement, Sunrise Wind would not be able to construct its proposed Project or any of the action alternatives described in the Draft EIS.

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	reject the entire proposed Project for the same reasons. Basing decisions on contracts/agreements/developer goals even if they were feasible is inappropriate, since if BOEM binds itself to those contracts it essentially gives the developers and PPA companies the exclusive right to dictate BOEM NEPA review. This is precisely what has happened with the Sunrise Wind DEIS. We request that BOEM conduct full NEPA analysis of the various "Alternatives Considered for Analysis in this DEIS but not Analyzed" that were rejected due to purported lack of economic feasibility, and/or consider a full disapproval and rejection of the proposed Project due to economic infeasibility to be consistent with the current rationale for rejecting the Alternatives not Analyzed.	
BOEM-2022-0071-0232-0002	BOEM originally designated the lease area in 2012. No re-examination of the environmental cost, in light of emerging science, has subsequently occurred. The current lease, and all other leases for projects along the Atlantic coast, continue to rely on this out-dated environmental assessment from 2012. Acceptance of the leases' validity allows the current DEIS to compare the current project to either a "no-action" alternative or to altered configurations within the given lease area. The reliance on comparing the project to a "no-action alternative" masks all potential environmental harm and renders the DEIS almost meaningless. BOEM needs to re-examine the safety and	The EIS uses updated data collected by the developer within their Lease Area as well as any other available data collected through agencies or stakeholders. Under the cumulative impact analysis, resources are analyzed based on their GAA and other proposed wind farm projects. Additionally, the baseline conditions include existing conditions in the ocean environment, as well as other wind farm projects that have either been built or approved for construction.

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	appropriateness of the lease area in light of up-to-date scientific studies before proceeding.	
BOEM-2022-0071-0232-0005	Most glaringly, the DEIS fails to include interactions between multiple pressures in the cumulative impact assessment. A recent review of the literature stresses the significance of this gap in our knowledge (Galparsoro, 2022). BOEM needs to prepare a programmatic EIS to examine the entire wind development of the outer continental shelf, including all interactions. Individual stressors do not act in isolation and can have a negative synergistic effect that can accumulate and exponentially increase environmental damage. Given that BOEM plans to develop 22 million acres of the Outer Continental Shelf, an assessment that considers interactions seems particularly important. No further developments should occur until a cumulative impact assessment includes a complete programmatic review and a full assessment of interactions.	BOEM's regulations require BOEM to analyze Sunrise Wind's proposal to build a commercial-scale wind energy facility on the Renewable Energy Lease Number OCS-A 0487. The purpose and need in the EIS reflect the requirement per those regulations, whereas BOEM's purpose, as stated in Section 1.2, is to determine whether to approve, approve with modifications, or disapprove Sunrise Wind's COP, and to fulfill BOEM's duties under the lease. As outlined in Section 1.4, this EIS tiers to and incorporates by reference a number of programmatic assessments on wind energy development in the New England region. In support of the NEPA process, BOEM also develops white papers to provide detailed discussions of topics raised. These papers are summarized and iteratively incorporated into BOEM's offshore renewable energy NEPA documents as available. Completed BOEM white papers are available under the White Papers tab on this page: https://www.boem.gov/renewable-energy/national-environmental-policy-act-and-offshore-renewable-energy.
BOEM-2022-0071-0232-0006	BOEM offers no evidence for its conclusions that the impacts on wildlife and the environment will be minor or moderate, nor does the DEIS adequately define direct, indirect, and cumulative impacts. The authors use language such as "small" and "large" without any further specifications. This does not constitute a meaningful definition or criteria for either a scientific understanding or for the public's general ability to appreciate the consequences. These vague descriptors leave the public will no	Definition of impact level is included in Section 3.3. Each resource is evaluated for potential impacts, and impact determinations/conclusions are presented in a summary table at the end of the resource section. Cumulative impacts are defined in Section 1.6 and are summarized in each resource section.

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	objective bounds within which to evaluate the potential impacts of the project.	
BOEM-2022-0071-0232-0008	BOEM must be transparent on how impacts are quantitatively or qualitatively assessed.	Impacts are discussed in Chapter 3 for each resource area and justified with data or references.
BOEM-2022-0071-0232-0010	Without a rigorous scientific model, poorly defined, imagined adverse impacts cannot justify known impacts. The entire DEIS justifies their adverse impacts based on broad, unproven anticipated future effects of climate change and increased development. Moreover, the most recent literature does not support the projections in planetary temperature used by the DEIS. The impact assessments are not reasonable, legal, or scientifically defensible.	Thank you for the comment. BOEM used the latest current scientific information in its analysis of the SRWF.
BOEM-2022-0071-0232-0036	In light of the above fatal errors, if BOEM were to approve such a legally deficient DEIS, it would undermine the fundamental tenants of our democracy. Thank you for your time and consideration. I very much appreciate the opportunity to detail my concerns and have them entered into the administrative record.	Thank you for expressing your concerns and providing helpful comments for the Sunrise Wind EIS.
BOEM-2022-0071-0242-0013	NEPA is the fundamental tool for ensuring a proper vetting of the impacts of major federal actions on wildlife, natural resources, and communities; for ensuring reasonable alternatives are considered and identifying the most environmentally preferable alternative; and for giving the public a say in federal actions that can have a profound	Thank you for your comment.

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	impact on their lives and livelihoods. For a half-century, NEPA has ensured that federal agency decision-making is based on a thorough consideration of the environmental impacts of federal decisions. NEPA requires "efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man" and mandates that "to the fullest extent possible" the "policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with [NEPA]." To comply with NEPA, an EIS must, inter alia, include a "full and fair discussion" of significant environmental impacts. The Council for Environmental Quality once again clarified that under NEPA, agencies must consider direct, indirect, and cumulative effects of major federal actions. Under 40 C.F.R. §1508.1(g)(3), "cumulative effects" has the following definition: Cumulative effects, which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.	

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	In addition to a thorough examination of direct and indirect impacts, as well as mitigation measures, assessing cumulative effects is essential to understanding the impact of offshore wind on species and ecosystems along the coast. Additionally, under NEPA, BOEM must make every attempt to obtain and disclose data necessary to its analysis in order to provide a "full and fair discussion of significant environmental impacts." The simple assertion that no information or inadequate information exists will not suffice. Unless the costs of obtaining the information are exorbitant, NEPA requires that it be obtained. Agencies are further required to identify their methodologies, indicate when necessary information is incomplete or unavailable, acknowledge scientific disagreement and data gaps, and evaluate indeterminate adverse impacts based upon approaches or methods "generally accepted in the scientific community." Such requirements become acutely important in cases where, as here, so much about an activity's impacts depend on newly emerging science. As we expand upon later in this section, this duty also applies to the evaluation of reasonable alternatives. In particular, BOEM should provide an evaluation of the feasibility of various turbine technologies and foundations in the Final EIS. Finally, NEPA does not	

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	permit agencies to "ignore available information that undermines their environmental impact conclusions."	
BOEM-2022-0071-0248-0001	The Responsible Offshore Development Alliance (RODA) submits the following comments regarding the Bureau of Ocean Energy Management (BOEM) Notice of Availability of a Draft Environmental Impact Statements (DEISs) for both Sunrise Wind, LLC's (Sunrise) Proposed Wind Energy Farm Offshore New York1 and Coastal Virginia Offshore Wind (CVOW) Commercial Project. Due to the unrealistic time constraints, as more thoroughly discussed below, we address the two DEISs in the same document. We will specify when directing comments on a specific project. For example, we include a discussion on the Offshore Converter Station proposed in the Sunrise DEIS.	We value your input and apologize for the difficult timing constraints.
BOEM-2022-0071-0248-0003	It is unrealistic for BOEM, or any Agency for that matter, to inundate interested stakeholders and the public with public comment opportunities that seem designed to overwhelm and overburden those who the Agency's serve. The EPA's National Environmental Policy Act (NEPA) describes public participation, including subsection (a)(5) which highlights the need to "ensure meaningful public participation throughout the NEPA process." We question how meaningful input is possible given that BOEM currently has three DEISs in the Atlantic which have public comment deadlines between February 14th and February 21st.	We value your input and apologize for the difficult timing constraints.

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BOEM-2022-0071-0248-0004	This is in addition to other Agency activities, including BOEM, that stakeholders are currently following. Stakeholder fatigue is real and will surely impact the specificity, quality and detail of responses to these comment opportunities. This is particularly concerning for actions, like those covered in the DEISs, proposing to bring large-scale developments to our nation's oceans. There remain a significant number of unknown impacts which may be linked to these large-scale developments. For example, potential impacts to the Mid-Atlantic Cold Pool, primary production, larval dispersal, impacts of electromagnetic fields on marine life, protected resources (especially the endangered North Atlantic right whale), impacts of pile driving, changes in cost of electricity, impacts of onshore cables, costs and resources associated with upgrading current grid infrastructure needed to accommodate this energy source, and the true number of well-paying, permanent jobs. This list is not exhaustive and we refer you to the comment letter submitted by Seafreeze, Ltd for additional concerns. Additionally, for some identifiable impacts, there remains serious concerns about the scale and severity of those impacts. RODA and others have long called for a Programmatic Environmental Impact Statement (PEIS) with an adaptive management approach. Today we are reiterating that recommendation with the additional reason of ensuring the required	Regulations require BOEM to analyze Sunrise Wind's proposal to build a commercial-scale wind energy facility on the Renewable Energy Lease Number OCS-A 0487. The purpose and need in the EIS reflect the requirements per those regulations, whereas BOEM's purpose, as stated in Section 1.2, is to determine whether to approve, approve with modifications, or disapprove Sunrise Wind's COP, to fulfill BOEM's duties under the lease. As outlined in Section 1.4, this EIS refers to and incorporates by reference a number of programmatic assessments on wind energy development in the New England region. In support of the NEPA process, BOEM also develops white papers to provide detailed discussions of topics raised. These papers are summarized and iteratively incorporated into BOEM's offshore renewable energy NEPA documents as available. Completed BOEM white papers are available under the White Papers tab here: https://www.boem.gov/renewable-energy/national-environmental-policy-act-and-offshore-renewable-energy.

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	meaningful public participation. RODA and its members have submitted hundreds of comment letters to BOEM and its cooperating federal and state agencies outlining significant concerns associated with offshore wind energy (OSW) development on the Atlantic OCS, where these projects are proposed, and other areas that are essential to U.S. seafood production and U.S. food security. Unfortunately, BOEM continues to conduct environmental review using a piecemeal, rather than regional, approach.	
BOEM-2022-0071-0248-0005	Regulations implementing NEPA define Effects or Impacts as follows, "changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and include the following: Cumulative effects, which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."While the DEISs do provide content related to cumulative impacts of ongoing and planned activities, they fail to take a holistic view of the potential impacts from large-scale buildout of offshore wind developments on the Atlantic OCS. RODA, other fishing industry	The No Action Alternative assumes that the Sunrise Wind Project will not be built, but other offshore wind projects that have already been permitted for construction, or already constructed, as the baseline. This No Action Alternative is reasonable since these projects are permitted to be built and therefore will be the baseline conditions of the surrounding environment. The cumulative impact analysis looks at the possibility of all offshore wind farms becoming permitted to analyze the full impact of all offshore wind farms being constructed. Sections 1.6 and 2.1.1 discuss the how the cumulative impacts and the No Action Alternative are analyzed.

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	representatives, marine scientists, fishery management councils, the environmental community, and others have consistently requested BOEM take a cumulative approach to offshore wind planning and leasing. BOEM is doing the public and the environment a disservice by continuing to review individual projects in isolation despite the large number of projects it is "fast tracking" and the existing OSW energy production targets. It is difficult to imagine that it would not also benefit developers, transmission interests, and the public for BOEM to clarify its approach to cumulative effects review and at a minimum implement regional planning processes as robust as those it employs for oil and gas leasing.	
BOEM-2022-0071-0248-0007	The Supplemental Environmental Impact Statement (SEIS) completed in 2020 for the Vineyard Wind I project was intended to serve as a cumulative impacts analysis for multiple projects in the region. However, the SEIS was only incorporated into the record of that project as BOEM used an entirely different—and grossly insufficient—approach for the South Fork project just weeks later. It is unclear what, if any, approach BOEM plans to use going forward, although the new leadership at Department of Interior has made clear that they disapprove of any of the environmental review practices of the last Administration so these are likely to change. Politics must not interfere with scientific integrity or transparency and we request	Sections 1.6 and 2.1.1 discuss how the cumulative impacts and the No Action Alternative are analyzed.

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	BOEM clarify what document the public should review to understand the cumulative impacts of potentially 3,000 turbines whose installation it is "streamlining" into the seabed between MA and VA alone. We further request BOEM to provide explicit information as to how it will approach cumulative impacts reviews for this and future projects.	
BOEM-2022-0071-0248-0008	BOEM, as the agency hiring consultants to draft Environmental Impact Statements for offshore wind projects, has implemented an inadequate cumulative impacts strategy. It is unclear how BOEM decides which projects are included in an EIS. For the earliest projects (Vineyard Wind 1, South Fork, and Ocean Wind 1) BOEM's NEPA review focused on a single proposed project with a Power Purchase Agreement (PPA) in place. For CVOW, the EIS will be prepared without the project having a PPA. The CVOW DEIS describes the purpose of the proposed actin as "to respond to Dominion Energy's COP proposal." This is based, in part, "on the goals of Dominion Energy, BOEM's authority, and Executive Order 14008." "Dominion Energy's Dominion Energy's goal is to develop a commercial-scale offshore wind energy facility in the Lease Area; to provide between 2,500 and 3,000 megawatts (MW) of energy, making landfall in Virginia Beach, Virginia; and to use the offshore wind power generated from the proposed Project to supply its own customers." In summation, there appears to be no standard protocol for when BOEM	BOEM does not hire consultants directly. Throughout each EIS, BOEM strives to improve analysis through lessons learned and input from public, stakeholders, and consulting parties.

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	will conduct a project's EIS, and inconsistency is increased when analyses are conducted piecemeal for each phase versus across an entire lease area or geographic region. As the PPAs have, in the past, determined BOEM's range of alternatives and what fisheries mitigation measures can be considered within the project parameters, this leads to significant uncertainty regarding how BOEM will conduct the upcoming NEPA reviews. Moreover, the current approach makes it nearly impossible to conduct any cumulative analysis as there is no appropriate time in the federal process to do so.	
BOEM-2022-0071-0248-0009	Additionally, since the Notice of Intents to prepare these DEISs,15 BOEM has taken action on many other relevant activities in the region. There have been multiple DEISs, a regional USCG Port Access Route Study, an auction for six additional leases in the New York Bight, publication of several more Draft WEAs (Central Atlantic WEAs), and identification of Draft Call Areas in the Gulf of Maine. Both DEISs include an Appendix entitled Planned Activities Scenario. Each of these estimate the total number of operational turbines in the Atlantic OCS to be 3,101 by 2029. This does not include areas which have been identified for potential development (Central Atlantic and Gulf of Maine) which could increase that number significantly. Yet, BOEM has not sufficiently evaluated the cumulative impacts of prospective activity in the region. This must be remedied	Cumulative impacts have been analyzed within this Final EIS. Section 1.6 discusses how the cumulative impacts and the No Action Alternative are analyzed.

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	immediately and should be incorporated into all future analyses conducted by BOEM.	
BOEM-2022-0071-0248-0010	RODA strongly urges BOEM to reconsider the sequencing of the site assessment, COP approval, and NEPA initiation for OSW projects, as the current rushed timeline has resulted in Proposed Alternatives that may not be possible given technical constraints. If the site assessment is fully complete prior to the COP approval and initiation of the NEPA analyses, the Proposed Action would be better informed. A compression of these different analyses and permitting actions means the public is not adequately informed of the expected project design and again demonstrates why alternatives should be fully analyzed and compared against each other - not solely to the Proposed Action. We strongly urge BOEM to require geological information, which may drastically change a project design in light of fisheries impacts, be more readily available early on in the process. A rushed process does equal a better process.	Thank you for your comment.
BOEM-2022-0071-0248-0011	In the DEISs, the No Action Alternative assumes only the Proposed Action will not occur. "[A]ll other past and ongoing impact-producing activities would continue." This assumes full buildout of existing and foreseeable future activities - including other energy developments - without also providing information or comparison of alternatives against an undeveloped (no construction) region. As presented, the DEISs presuppose the approval of	The No Action Alternative assumes that the Sunrise Wind Project will not be built, but other offshore wind projects that have already been permitted for construction, or already constructed, as the baseline. This No Action Alternative is reasonable since these projects are permitted to be built and therefore will be the baseline conditions of the surrounding environment. The cumulative impact analysis looks at the possibility of all offshore wind farms becoming permitted to analyze the full impact of all offshore wind farms being constructed. Sections 1.6 and 2.1.1

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	future OSW projects that have not even begun an environmental assessment, nor have the public had the opportunity to provide input to. This results in multiple issues: • The DEIS provides the public with misleading information as it presumes construction of OSW in all the leases in the region. Project approval must not be expected preemptively. • The public cannot reasonably differentiate and assess if a specific project and regional OSW development are worth the impacts they will cause; both known and unknown. • The impacts of these projects are diluted and obscured as they are only compared against regional buildout rather than no development. • Contribution of each project to cumulative impacts is minimized. One project may not seem “that bad” in comparison to the potential buildout of all leases and WEAs in the region, but the cumulative impacts of all these projects will be the most harmful to the marine environment and ocean users. At a minimum, an additional alternative should be analyzed and compared against the design envelope of the project for which the DEIS has been	discuss how the cumulative impacts and the No Action Alternative are analyzed.

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	prepared: a No Development Alternative. The No Action Alternative as presented should still be included in the DEISs but a complimentary No Development Alternative should be provided to the public also. Again, this demonstrates the need for a robust cumulative impact assessment and mitigation measures aimed to address cumulative impacts to understand the true impacts of OSW in the Atlantic.	
BOEM-2022-0071-0248-0013	Since the scoping period for these DEISs, BOEM issued a new policy that has the effect of excluding alternatives from environmental review that would in fact reduce or mitigate fisheries impacts. The "Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operations Plans pursuant to the NEPA" released in June 2022 standardizes the alternatives BOEM will consider during the NEPA process and clarifies BOEM's policy of considering only a narrow range of alternatives consistent with a developer's preferred project plans. Indeed, it affords the terms of cost-competitive procurement agreements "more deference than a typical contract between two private for-profit entities," although such contracts are nearly entirely driven by profit and energy maximization and without environmental review. The document only references mitigation in the context of what should	Thank you for your comment. BOEM's regulations require BOEM to analyze Sunrise Wind's proposal to build a commercial-scale wind energy facility on the Renewable Energy Lease Number OCS-A 0487. The purpose and need of the EIS reflect the requirements per those regulations. BOEM's purpose as stated in Section 1.2 is to determine whether to approve, approve with modifications, or disapprove Sunrise Wind's COP, which is needed to fulfill BOEM's duties under the lease. As part of the NEPA process, alternatives were considered and screened if it was outside the jurisdiction of the lead agency. Mitigation and monitoring measures identified for consideration in the EIS and Record of Decision are summarized at the end of each resource area. Appendix H, *Mitigation and Monitoring* further describes the EPMs committed to by the developer in the COP, and additional mitigation and monitoring measures being considered by BOEM.

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	not be considered as a NEPA alternative; that is, it suggests actions with "substantially similar effects" to other options should be considered outside of the range of alternatives. We urge BOEM to reconsider this policy. Specifically, for these projects and all other proposed OSW projects, the agency should include alternatives for analysis in each of its environmental review documents describing specific fisheries mitigation solutions and afford these full, neutral consideration. Stand-alone alternatives will more clearly inform public comment and allow better evaluation of potential mutual benefits or tradeoffs. As a public agency, BOEM's consideration of alternatives should include those that reasonably mitigate impacts to fishing and businesses dependent upon fishing, whether or not a developer has voluntarily proposed to incorporate them in its Construction and Operations Plan (COP) and whether or not they could require reasonable modifications to private contracts.	
BOEM-2022-0071-0248-0014	It is imperative the public is able to differentiate impacts from the various alternatives presented in the DEISs to understand the suitability of prospective project alternatives. The DEISs analyze the impacts of multiple grouped alternatives primarily as modifications to the Proposed Action, rather than against each other. Using fisheries as an example, the DEISs present Impacts Analysis for Commercial and For-Hire Recreational	The Draft EIS did not determine a "likely alternative" and each alternative was analyzed separately. Each alternative is compared against the baseline environment. Alternative C is a habitat minimization alternative and removed WTG from certain areas. Changes in the WTG configuration would not change impacts for some resource areas or would only slightly change impacts when compared to the Proposed Action. This is because all other actions within the Proposed Action would occur under these alternatives, except for WTG locations. By referring to the Proposed action

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	Fisheries for each of the Alternatives together. That each DEIS acknowledges major adverse impacts on commercial fisheries is much appreciated.21 It is unclear in the documents how impacts from the various alternatives differ from each other. Instead, the impact analysis compares the collective back to the Proposed Action, which the DEISs assume would be the most likely "Alternative". From discussions with leaseholders in other project areas, it is our understanding that technical constraints may be realized after DEIS completion that make the Proposed Actions unfeasible. Yet, it is still the project design that all other alternatives are compared against.	analysis and only highlighting differences under Alternative C, it keeps the document concise and reduces redundant information.
BOEM-2022-0071-0248-0018	Confusion is further compounded as the different alternatives can be combined for the Final EIS. The alternatives listed in each DEIS are not mutually exclusive. BOEM may "mix and match" multiple listed Draft EIS alternatives to result in a preferred alternative that will be identified in the Final EIS provided that: (1) the design parameters are compatible; and (2) and the preferred alternative still meets the purpose and need." This is concerning in the sense that the public cannot effectively understand what is the preferred alternative. It is setting up an opportunity for a bait-and-switch when the preferred alternative will not be revealed until the publication of the Final EIS. Principles of transparency and informed decision-making should never be undermined and the public	BOEM's identification of the Preferred Alternative is informed in part through consideration of public comments on the Draft EIS. Mitigation recommended for inclusion in the Preferred Alternative is informed by consultations that were ongoing at the time of Draft EIS publication. Identification of the Preferred Alternative in the Final EIS supports consideration of public comments on the Draft EIS and incorporates the results of the consultations.

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	should be fully informed throughout the process.	
BOEM-2022-0071-0248-0045	Concluding recommendations: We recommend BOEM release for public comment a Supplemental Environmental Impact Statement (SEIS) that addresses concerns raised in this letter and by other commenters. We recommend this SEIS not be published until: Data gaps and concerns above are addressed Completion of BOEM funded study examining movement patterns of Atlantic cod, black sea bass, and other fish stocks in southern New England region; and The July, 2022 Habitat Area of Particular Concern proposed by the New England Fishery Management Council is finalized Note, this list is not exhaustive.	Thank you for your comment. The Final EIS will be moved forward when all agency and public comments have been reviewed and addressed. A Supplemental EIS is not considered necessary.
BOEM-2022-0071-0249-0009	Moreover, the DEIS fails to incorporate best practices and minimum guidelines that would apply to all offshore wind developments near the City of Newport and Town of New Shoreham. In specifically requiring cumulative impacts analyses, NEPA recognizes the significant effect that reasonably foreseeable projects can have on the surrounding landscape beyond the scope of a single development. BOEM's analysis and methodology for assessing cumulative impacts in the DEIS are confusing and unclear. Consulting parties and the public have a right to understand BOEM's conclusions and how it arrived at them. Currently, no reasonable person can interpret them.	Apologies for the confusion on the cumulative impacts analysis. Sections 1.6 and 2.1.1 discuss how the cumulative impacts and the No Action Alternative are analyzed.

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BOEM-2022-0071-0249-0035	BOEM has the duty to assess adverse effects; the NHPA does not place the duty on consulting parties to extrapolate, guess, or fill in the blanks. Without a comprehensive understanding of adverse effects on NHLs, BOEM cannot possibly demonstrate all possible planning to minimize harm because the full extent of Sunrise Wind's adverse effects is unknown	The EIS document provides a detailed description of the impacts of the Project. The EIS Introduction, Sections 1.5 and 1.6, provides the methodology for assessing the environmental impacts used for this federal action in accordance with NEPA requirements and other regulatory frameworks. Chapter 2 of the EIS provides information on how alternatives were scoped, including scoping meetings for public involvement. Chapter 3 of the EIS identifies the affected environment, including as it relates to cultural resources and historic properties, provides the basis for IPFs for affected resources, and analyzes impacts. BOEM is addressing all of the regulatory requirements of the NHPA Section 106 process, including NEPA substitution, as it proceeds through the NEPA analyses. BOEM informed the public and all NHPA Section 106 consulting parties that would use the NEPA process to substitute for the steps in the Section 106 process when it released the NOI for the Project. BOEM has engaged in, currently engages in, and will continue to consult with Tribal Nations, SHPOs, Advisory Council on Historic Preservation, and consulting parties involved in historic preservation within the development areas. Consultation has included and will continue to include cultural resource identification, assessment of effects, and resolution of adverse effects on historic properties.
BOEM-2022-0071-0249-0037	BOEM HAS INAPPROPRIATELY CLASSIFIED DOCUMENTS AS CONFIDENTIAL AND FRUSTRATED PUBLIC SCRUTINY.	The EIS and its appendices are all publicly available, when appropriate. Documents contained within the COP contain sensitive and confidential material, which is up to the developer to publicly release.
BOEM-2022-0071-0249-0038	Section 304 of the NHPA protects certain sensitive information about historic properties from disclosure to the public when such disclosure could result in a significant invasion of privacy, damage to	Thank you for your comment, sensitive material was not disclosed to the public.

Comment No.	Comment	Response
	the historic property, or impede the use of a traditional religious site by practitioners.	
BOEM-2022-0071-0249-0042	As the above list demonstrates—and which comprises the most important aspects of environmental permitting review—BOEM has conducted its NEPA and NHPA under a cloud of secrecy, which is the opposite of how Congress intended these laws to operate. Therefore, we request that BOEM immediately make all technical reports public unless a legitimate reason exists for confidentiality and only after NPS and ACHP review. Congress passed NEPA and the NHPA to help ensure that the public could understand the effects of government undertakings on the natural, cultural, and historic environment. Section 304 of the NHPA allows sensitive information to be redacted but does not allow blanket and indiscriminate non-disclosure. Keeping Sunrise Wind reports confidential undermines this public intent, especially where it does not appear that BOEM has any legitimate justification for keeping the reports confidential and exempt from the Freedom of Information Act or FOIA.	BOEM has consulted with the Advisory Council on Historic Preservation and coordinated with the NPS about a plan on how to handle sensitive information potentially subject to Section 304 of the NHPA. BOEM has not yet formally initiated the Section 304 consultation pursuant to 36 *CFR* 800.11(c) for the Section 106 consultation on the Project. The NPS has informed us that the Section 304 regulations of the NHPA do not specify when or if an agency is required to initiate consultation with the Secretary of the Interior within the course of an ongoing Section 106 consultation. In addition, the NPS advised BOEM that it is acceptable for a federal agency to wait to disclose Project findings to the public until identification of historic properties, including sites of religious and cultural significance to tribes, and potential effects to these properties have concluded and consensus evaluations of NRHP eligibility have been completed. From the beginning of the Section 106 consultation for the Project, BOEM has planned to distribute the reports that contain sensitive information to the consulting parties and to post publicly available summaries or redacted versions of Section 106– related documents to BOEM's website. The consulting parties have received all the available information and documentation associated with this Section 106 consultation, including sensitive information that could be subject to Section 304. The basis for making all of the revised technical reports confidential (reports associated with the preparation of the Draft EIS) as opposed to redacting sensitive portions and making the documents public is as follows: the documents could contain sensitive information that could be subject to Section 304 of the NHPA.

Comment No.	Comment	Response
BOEM-2022-0071-0249-0044	In conclusion, BOEM must revise the DEIS and associated reports for the reasons explained above. BOEM must also declassify and make publicly available all documents that BOEM has inappropriately withheld from public review and restart the NEPA and NHPA process so that consulting parties and the public can consult meaningfully with BOEM to resolve Sunrise Wind's adverse effects.	The EIS and its appendices are publicly available. Some documents within the COP contain sensitive and confidential material, and it is up to the developer to publicly release them. The sensitive information on historic properties that was either summarized in publicly available documents or redacted from public documents is information that relates to the ownership, character, and location of historic properties that are not necessarily of public record, particularly archaeological sites and sites of traditional religious and cultural significance to Tribal Nations. While BOEM shared complete, unredacted versions of all documentation with consulting parties for their review, BOEM did not provide full versions of all Section-106-related documentation to the general public. However, BOEM did make public summaries or redacted versions of all such documentation to facilitate public involvement in the Section 106 process and comment on the Draft EIS.
BOEM-2022-0071-0251-0002	First and foremost, we do not believe that comment periods offered by BOEM for any of the various offshore wind lease areas has given the commercial fishing industry adequate time to keep up with BOEM's new "fast and furious" approach to mainline the offshore leasing and approval process and prepare and comment. It does appear through scheduling multiple comment due dates within days of each other that BOEM is trying to overwhelm our industry and our stakeholders, which in New York is comprised almost solely of small-family businesses. Due to the breadth of reading material for each lease area, we believe BOEM should allow for a full ninety days from a draft EIS release to the comment period due, and	Thank you for your comments and for taking the time to review the EIS. We understand the schedule was difficult but BOEM's intention was not to overwhelm stakeholders or the industry. The comment period is legally required to be 45 days long, the SRWF EIS comment period was extended to 60 days to allow more time for the public and stakeholders to review and provide comments. While the overlapping comment periods was unfortunate, not allowing overlap would have consequences for the EIS schedules as they are only supposed to take 2 years from the date of the Notice of Intent.

Comment No.	Comment	Response
	specifically start a 90-day clock, so that no other BOEM comment period could be scheduled until the 90-day clock is over, meaning zero overlap between comment periods.	

O.6.25. Other Topics

Table O-33. Responses to Comments on Other Topics

Comment No.	Comment	Response
BOEM-2022-0071-0249-0041	BOEM has either labeled the following documents as "confidential" or redacted them in the Construction and Operations Plan: • Appendix D – Certified Verification Agent • Appendix E1 – Emergency Response Plan/Oil Spill Response Plan • Appendix E2 – Safety Management System • Appendix F – Conceptual Project Engineering Design Drawings/Additional Project Information • Appendix G1 – Marine Site Investigation Report • Appendix G2 – Munitions and Explosives of Concern (MEC) and Unexploded Ordnance (UXO) Risk Assessment with Risk Mitigation Strategy • Appendix G3 – Foundation Feasibility Assessment • Appendix G4 – Cable Burial Feasibility Assessment • Appendix K – Air Quality Emissions Calculations and Methodology • Appendix R – Marine Archaeological Resources Assessment • Appendix S1 – Terrestrial Archaeological Resources Assessment	Developers can mark certain documents as confidential or redacted according to BOEM's criteria.

Comment No.	Comment	Response
	• Appendix S2 – Terrestrial Archaeological Resources Phase 1B Assessment – REDACTED • Appendix T – Historic Resources Visual Effects Assessment (not labeled confidential in COP but no link provided) • Appendix W – Economic Modeling Report • Appendix Z – Cultural Resources Mitigation Plan	

O.7. General Comment Summaries and Responses

O.7.1. General Support

Table O-34. General Support Comments

Comment No.	Comment	Response
BOEM-2022-0071-0003	I support the Sunrise Wind, LLC application. This project will bring much needed energy to New York State with minimal environmental impact. I urge the rapid completion of the permit review process to allow this critical infrastructure project to move to construction.	Thank you for your comment.
BOEM-2022-0071-0004	Hello, My name is Eleanor Kobel and I have lived on the east end of Long Island since I was born in 1964. I am in full support for our wind farm and offshore wind power. It's much needed, because of climate change and fossil fuels alone. We need to think about the future. This project will produce clean energy, as well as creating jobs, and secure our natural resources to preserve not only our beautiful east end but our planet. It all has to start somewhere. We can start this change for a better future for not only our children and grandchildren but for our planet. Thank you, Eleanor Kobel	Thank you for your comment.
BOEM-2022-0071-0005	I am Southampton Town resident, a geologist/environmental scientist, a NYS Certified Profession Geologist, and a recreational waterman. I support the development of alternative energy sources and support the Sunrise Wind project. I believe this project will have minimal impact on the environment and will create an overall environmental benefit and create job opportunities.	Thank you for your comment.
BOEM-2022-0071-0006	i am in support of Sunrise Wind LLC's proposed Wind Farm Offshore in New York. Wind farms have proven productive and a safe way to provide electricity and reduce our dependency on fossil fuels, which contribute to global warming. My research has led me to believe that Ordtead is a world class and reliable developer and operator of	Thank you for your comment.

Comment No.	Comment	Response
	wind farm technology and we can feel confident that this development will be be constructed safely, securely and using environmentally sound measures.	
BOEM-2022-0071-0007	Progress is an interesting word. It means “the development of a better, advanced stage”. A simple example is electricity. A natural phenomenon such as lightning has progressed to the creation of the generator. This progression is not without caution. Obviously, the use of electricity is an enormous progression, but caution must be used regarding items such as the cost of and source of fuel. The establishment of off shore windmills is a further progression, using the natural phenomenon of wind power. The caution here is the health of the off shore environment and the associated aesthetics. The technology and research today enable us to build submersed infrastructure which will actually enhance the natural environment. This project will be invisible from and on the land. This is truly a step in the right direction.	Thank you for your comment.
BOEM-2022-0071-0008	Relic is a Long Island brand founded on making a local impact on our coastal environments. Our following and supporters consist of thousands of Long Islanders who are passionate about protecting the future of our coastlines. As a sponsor of our beach clean up station program, we find ourselves frequently discussing Sunrise Wind and their offshore wind projects with folks that we meet. From many interesting conversations, we have observed that those who are passionate about Long Island’s environmental future also support of wind energy. We frequently express our opinion that having access to clean energy, such as from this wind farm project, is critical in combating climate change. It is also vital to the future of our marine ecology on Long Island and in the North East. Additionally, relic supports the development of more jobs in this sector for Long Islanders. Together, we hope for a future that can support Long Island’s growing population and the struggling ecology of our coastlines and bays. We strongly feel that this project will play a vital role in achieving this future vision.	Thank you for your comment.
BOEM-2022-0071-	My name is Alex Kravitz and I am a born/raised Long Islander with a dire love for its	Thank you for your

Comment No.	Comment	Response
0009	environment. I have been fortunate to have had the opportunity to work on multiple sustainability projects with the Sunrise Wind organization. There is no question for the need of this clean energy project on Long Island. With the ever-pressing presence of climate change on our local environment, we need to take every step possible to open the door for change. Not only will this project contribute clean energy for our use, but it will also aid in benefiting the local marine life who share the waters nearby to the offshore site. The creation of this underwater structure, better known as an artificial reef, has been proven to be a positive contributor in increasing the habitable areas of our waterways for local marine species. If we are okay with the decimation of our ocean bottom attributed to oil drilling and commercial dragger fishing, we should have absolutely no refrain for the adoption of a clean energy project that will not only provide us a renewable energy source but also a habitat for local marine life.	comment.
BOEM-2022-0071-0010	My name is Brienne Ahearn and I'm the Program & Development Director at The Butterfly Effect Project, a non-profit youth empowerment and mentoring organization that serves young people in Suffolk County. I'm submitting this comment in support of Sunrise Wind's Offshore Wind Farm. The Butterfly Effect Project had the unique experience of partnering with Sunrise Wind to support our chapter located on The Poospatuck Reservation, located in the Mastic area. With the support of Sunrise Wind, we implemented a technology training program that benefited both our Poospatuck youth and seniors. Poospatuck youth participants underwent a brief training program to learn how to navigate tablets, including downloading the necessary programs and applications, and learning how to use all of their functions. They then, in turn, taught their elders and grandparents to use the devices. This technology program benefitted two of the most vulnerable populations in these communities; seniors and youth. Not only addressing the lack of access to technology and the inability to navigate it, but also providing our young people with supplemental income. Furthermore, it prepared youth for the upcoming school year, and addressed the issue of isolation among our senior population. Through this program, technology was a point of intergenerational sharing, learning, and relationship building. This project demonstrates Sunrise Wind's investment in the future of local youth and	Thank you for your comment.

Comment No.	Comment	Response
	communities. We all know the existential threat that the reliance on fossil fuels, and the devastating effects of climate change pose to our youth and our futures. Sunrise Wind Farm begins to address this threat, and offers a cleaner and brighter future for our children and communities. Clearly, the company is dedicated to holistic support of the community where it's located- using environmentally sound technology and innovative ideas to show youth what's possible. The Butterfly Effect Project lends its support.	
BOEM-2022-0071-0011	Historically Long Islanders" relationship with local waters has developed their unique sense of identity. Without projects like Sunrise Wind's proposed wind farm, this identity will continue to fade away as our waters become commercially and recreationally unsustainable. We must act quickly to establish wind farm infrastructure to provide residents of the North East with clean energy sources. If we permit dragging and oil drilling, why should we not allow a wind farm that will actually promote habitat for marine species? As the legend said himself, "There will be no Island left for Islanders like me" if we don't act quickly and in a combined effort to reverse the negative impact we have made with our dependence on fossil fuels. I stand in support of this wind farm project and hope that it can be established as soon as possible, as everyday is vital in the extremely time sensitive battle to preserve the state of our environment and identity as Long Islanders.	Thank you for your comment.
BOEM-2022-0071-0012-0001	To whom it may concern: Hi I'm Kelsie Linell. I am proud to say that I hold my 100 ton license and am co-captain of my fathers two fishing vessels the M/V Fleet King and the M/V Fleet Queen. I am proud to be here and support the Sunrise Wind's Draft Environmental Impact Statement. And as a fishing vessel captain, I am also proud to be directly working to support the development and construction of Orsted's Sunrise Wind project. Our environment is changing, and its effects are felt on land and on the water. We need clean energy and we need it now, we need to stop digging ourselves into a hole that we might not be able to get out of. No doubt, at first Offshore wind energy was scary. But the more my family did our own research, we realized that the concerns we and other fishermen had -while real- real, but with investigation and real engagement with offshore wind people, we cam to our own conclusion. Offshore wind	Thank you for your comment.

Comment No.	Comment	Response
	could be a new way to sustain our family business. In fact, the scout work we have done through Sea Services has allowed me to stay working on the water. Today, I still have to juggle a few things to make ends meet, but I see our offshore wind work as a way for me to continue the family fishing business for another generation. And I think it's very important to be doing our part to help address the warming climate. This will sound corny, but nature has been good to us, and it seems to me that this is a way for us to give a little back to nature. Please approve Sunrise Wind's DEIS as quickly as possible and move through the long list of other offshore wind projects as thoroughly and as quickly as possible! Thank you for your time. Kelsie Linell Co-Captain M/V Fleet King / M/V Fleet Queen 101 Mill Hill Road South Chatham, MA 02659	
BOEM-2022-0071-0012-0002	To whom it may concern: My name is Matt Linnell and I own the M/V Fleet King and M/V Fleet Queen. I have been a commercial fisherman my entire adult life. For generations, we have depended on the very waters where Orsted's Sunrise Wind will be constructed for our livelihood. I am here to add my support for the Project's "DEIS" and to urge you to expedite its full approval. Let me tell you why. Like everyone who fishes or transits through these so called "lease areas," we were extremely concerned about offshore wind development. The idea seemed bad on its face. We were all frightened that closing down all these fishing grounds would crush our business. We heard that these offshore wind companies hailing from across the Atlantic didn't have any real interest in our industry and in working with us. We heard a lot of things and we were frightened. But over my lifetime, fishing has grown far more challenging due to migration, quotas and over-regulation. It is harder than ever to make a living doing what we love. So my family and a group of fishermen dug in to try to answer the question for ourselves: "Is offshore wind the final nail in our coffin, or could it be a new opportunity?" Everyone is entitled to their own opinions. And I am offering ours. We found that some of the information being put out there was just incorrect. The most important issue was that these wind farms in the U.S. will not be closed to fishing and turbines will be spaced to allow for safe fishing and safe passage. There is no doubt that a nautical mile is plenty of space to set gear and to safely transit. We will have to get used to it, but that's more than enough space. We found that many other things	Thank you for your comment.

Comment No.	Comment	Response
	have proven to be less alarming than they may sound in the press. So, about 18 months ago, we qualified to become Vessel Partners with Sea Services. And with their support and funding, we upgraded our two vessels" health and safety platforms. And that resulted in much needed additional work. We have since scouted for about 180 days in the northeast and in the mid-atlantic. I am proud to say that there were zero resulting gear strikes. And through Sea Services, we have had the opportunity to work up close with Orsted and a few other offshore wind developers. This has allowed us to build trust and to realize that there is a sincerity to this vision working together. Offshore wind work won't be all roses. But that's fine. Fishing isn't all roses either. But our family believes in the future of these two industries. And that In the combination lies the difference between a struggling generational fishing family, and a diversified, thriving family business. Therefore, I offer my complete and enthusiastic support for Sunrise Wind's DEIS. Sincerely, Matt Linnell 101 Mill Hill Road South Chatham, MA 02659	
BOEM-2022-0071-0012-0003	To whom it may concern: My name is Rob Cabral, and I have been a commercial fisherman for over 35 years. I own, and captain the F/V Provider. I speak on behalf of myself, and my family, as 3 of my 4 sons have worked aboard the Provider while in service to Orsted's projects. While it is no secret that many fisherman have concerns about offshore wind, my family decided to get involved and address these issues on a first hand basis. Then, through the leadership of of Sea Services, and the commitment from Orsted, we spent nearly 4 months upgrading certain physical requirements onboard the vessel, as well as extensive health and safety training and certifications for our captains, and all our crew members. It was quite an eye opening process, and I feel that all those involved have benefited greatly for it. This allowed us to win a first-ever commercial fishing scouting contract with Sea Services and Orsted, becoming the first commercial fishing vessel in the U.S. to meet the stringent training, environmental, and safety standards required for scout, and guard work in the offshore wind field. Orsted's commitment to having qualified fisherman involved in its projects has been quite surprising for a skeptical fisherman like myself. Through Sea Services, Orsted supplied funding for the necessary vessel upgrades, and all the	Thank you for your comment.

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	required training. Without this support we would most likely not have been involved with Orsted or offshore wind projects, as it all would have simply been too daunting of a task for one small company. Im happy to say that this year starts our 4th season working offshore wind projects. And in that time Orsted's commitment, and standards to safety protocols, as well as environmental awareness has been second to none. We have logged over 450 days at sea, on various scouting projects. I am very proud to say that in all that time, the offshore wind research vessels that we have scouted for have had zero gear conflicts with the US commercial fishing fleet. I am proud of this statistic because it means that we have prevented a lot of guys from loosing their gear, and we have saved research vessels a lot of time and money from not having to stop the project to disentangle fishing gear from their scientific equipement. I personally have met some resistance, and slight animosity from some of my peers in the commercial fishing industry. This has not been an easy thing to deal with, as some of these guys I have known and worked with for over 30 years. Over time, some have seen the value of our work, especially the fisherman who have had gear in and around the survey areas. I have had many personal conversations with these fisherman, who are truly grateful for our work, and are comforted to know we are there to document their gear, and it's location, and to make sure the survey vessels know, as well. I can speak for myself, and my crew, when I say that we are grateful for the opportunity to be involved with this project, and after what we have seen firsthand, are fully in support of the Sunrise Wind Project going forward. Sincerely, Captain Robert Cabral F/V Provider	
BOEM-2022-0071-0012-0004	To whom it may concern: My name is Robert Groves. I'd like to thank BOEM for this opportunity to speak in support of Sunrise Wind's Draft Environmental Impact Statement. I have been a professional mariner for longer than I want to admit! I have fished, I have captained fishing vessels, offshore supply vessels, and most recently tug boats. I hold a 1600 ton Master of Towing license. I strongly believe in the need to accelerate and advance renewable energy and offshore wind. Yes, I have solar panels on my roof! But in particular, I strongly support the development and construction of Orsted's Sunrise Wind project. The ocean environment is being effected by climate	Thank you for your comment.

Comment No.	Comment	Response
	warming today and I want to thank BOEM for doing the rigorous work of evaluating this offshore wind project and the many others in the que. We need to get offshore wind mills spinning, and creating massive amounts of clean energy as soon as possible. I've recently captained Sea Services Vessel Partner M/V New Horizon for 40 days of scouting work with a crew of 5. Scouting work is good and important work. Because fishermen are so familiar with these waters and know how to communicate with other fishermen, our results are better than those of conventional vessels. It is clear to me that Orsted and the other offshore wind companies we have worked with have a real interest in reducing conflict. Scout work is just one example. Also, anyone who has fished has horror stories about one life threatening situation they have faced or another. Health and Safety are always a concern for guys on the water, and offshore wind developers who are using Sea Services are applying (and funding) very high HSE standards to boats and crews for upgrades and training. This is a big, big deal. Last, I know a lot of guys who just can't make a living fishing full-time anymore. Sunrise Wind and other offshore wind projects who have chosen to use fishing vessels for scouting and guard work have already provided a new way to bring home additional income.	
BOEM-2022-0071-0012-0005	To whom it may concern: My name is Scott Dernberger and I am Co-Captain on the F/V Provider. I have been a fisherman since 1991, but when I was approached with about offshore winds projects, I had serious doubts. Although many of my peers did not necessarily agree with the wind farm we decided to get involved. With help from Orsted we were able to get needed vessel upgrades and safety training for everyone onboard. Over the past several years that we have been scouting, we have developed a level of trust with our colleagues in the fishing industry that we are there to represent both them and Orsted to avoid gear conflicts. Many have expressed their appreciation to me for "keeping an eye" on their gear and helping avoiding any conflicts by sharing gear positions with survey boats. Being the first scout vessel there was a learning curve that SS was there to help us through. I fully support the Sunrise Wind project and am happy to be a part of it. Sincerely, Captain Scott Dernberger	Thank you for your comment.
BOEM-2022-0071-0012-0006	To whom it may concern: My name is Scott Yerman. I have been fishing for 40 years, starting with my father when I was 8 years old. While I don't particularly enjoy	Thank you for your comment.

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	speaking at public hearings, I am actually glad to be here tonight in support of Orsted's Sunrise Wind project. There are three things that I want to share. 1. The concerns that remain out there are real about offshore wind, and I shared them. But after really digging into offshore wind with my father and other fishermen who are now part vessel partners in the Sea Services group, I came away much more realized than I thought possible. Particularly with the wind farms remaining open for fishing and the turbines spaced a mile apart, my biggest concerns were resolved. If more people did the same work, I'm pretty sure that they would come to the same conclusions we have: the Offshore Wind and Commercial fishing will be fine side by side for years to come. 2. Orsted's team have been straight shooters with us from the beginning a few years back. We were tough on them. As fishermen, we like straight talk and as it turns out, so do the Dane's. They do what they say. I can't ask for more than that. 3. Orsted is providing guys like me a new way to earn money. And it has already been good for me, and for my family. I am looking forward to working on Sunrise Wind once it's approved and into construction next year. Thank you. Scott Yerman Captain M/V Provider 5 C Street Westerly RI, 02891	
BOEM-2022-0071-0012-0007	To whom it may concern: My name is Tim Linell. I am the co-captain of the M/V Fleet King and M/V Fleet Queen. I have been a commercial fisherman for nearly 30 years. I am here tonight to support the Sunrise Wind DEIS. After a lot of concern and study I'm now very optimistic because we are actually working with offshore wind developers. And I don't see as much doom and gloom that you hear about on the docks, or read about in the press. Offshore wind is coming and we are making it work for us. As Sea Services Vessel Partners, we upgraded our two vessels" health and safety platforms. We have scouted for fixed gear for about 6 months and around 9000 miles of ocean ahead of large research vessels in the northeast and in the mid-atlantic. I am proud to say that there were zero resulting gear entanglements. With fishing regulations displacing many fishermen, we need these new opportunities to supplement shrinking fishing income. Tim Linell Co-Captain M/V Fleet King / M/V Fleet Queen 101 Mill Hill Road South Chatham, MA 02659	Thank you for your comment.
BOEM-2022-0071-	To whom it may concern: My name is C.J. Pinto. I'm here to fully lend my support for	Thank you for your

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0012-0008	Orsted/ Sunrise Wind Project draft DEIS. As a resident of Long Island, and having captained fishing vessels to tug boats for over 25 years, I am truly excited about the advance of offshore wind in the United States. Today, active fishing vessels need alternative revenue sources to keep boats fishing in the face of unrelenting government regulations. Offshore wind development and construction is playing an important role in allowing interested captain's new commercial opportunities. As vessel partners for Sea Services North America, two of our vessels the F/V Jo Ann V and F/V Gabrielle Elizabeth will be deployed on New York's Southfork and Sunrise Wind projects. This means important, additional work for captains and crews who otherwise might not get it. Orsted is the world leader in offshore wind farms for a reason. The Sunrise team has demonstrated a level of professionalism that seems unrivaled in the industry. And we are honored to play a small role in constructing these early wind farms. We know that this is only the beginning. We are investing in the offshore wind scout and guard vessel space and see Southfork and Sunrise Wind as the start of new business opportunities for our company and the men and women we employ. Please approve the Sunrise Wind Draft Environmental Impact Statement at speed to help this project create much needed jobs. Sincerely, Captain CJ Pinto Long Island, New York	comment.
BOEM-2022-0071-0012-0009	To whom it may concern: My name is Gary Yerman and I've been a commercial fisherman for 50 years. My son and I are the owners of New London Seafood Distributors, a New London-based unloading facility, and we have owned the business since 1989. It is home base for a dozen commercial fishing vessels both large and small, operating inshore in the sound and offshore to more than 100 miles. We are vital to their operations providing fuel, ice, arranging shipping of their annual 6,000,000 to 8,000,000 pounds of seafood to various markets. I write on behalf of both New London Seafood Distributors and as the co-founder of Sea Services, a multi-state consortium of active fishermen seeking to help build US offshore wind farms. I write in full support of Ørsted/Eversource's Sunrise Wind project. While offshore wind's development presents uncertainty to fishermen, it is just uncertainty. There is no doubt that uncertainty can be frightening and while the concerns raised by others was	Thank you for your comment.

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	important, we have to be willing to deal with facts rather than fear-based narratives. We have done a great deal of investigation and research and found that each of the concerns raised have been raised in wind projects around the world, with virtually no correlation between early concerns and actual commercial impact where fishing grounds remained open. Moreover, here in the U.S. we are calling on the global data and industry best practices to find solutions that will address the need for green energy, the fishing concerns and the fears of what is being labeled as "unknown." As commercial fishermen, local businessmen and concerned citizens, we are first concerned about our community and profitability. Other fishermen have decided to pursue dollars in the form of disruption payments, but we have found another way. We have decided to pursue a sustainable and scalable way to participate in the development, to be constructively at the table. So, once we achieved a level of comfort with the Ørsted team, we began to look for ways for our vessels, along with others, to work the waters with the offshore wind industry. We have spent time and energy with the Orsted's Sunrise Wind team, and we can say they are the very best in the offshore industry. Their investment in the project means a great deal for several New England fishing communities and we are already seeing the economic impact in New London. We want to see Sunrise Wind move forward rapidly. We have worked for nearly 4 years with Ørsted's Northeast team and they have been straightforward, accessible and as open as we think they can be. We understand the concerns of some of our fishing colleagues, but given the level of commitment to investment, education, job creation and reduction of fossil fuels, we have seen benefits and know that coexistence is a good thing, for the greater good. Two years ago, two associates and I took a trip to Kilkeel Northern Ireland to meet with a group of fishermen organized into an efficient cooperative that provides scout and safety vessels when they are not fishing. We learned firsthand how the wind farms have impacted them and how they and the community have profited by them. We shared our concerns and discussed how they have worked together for a positive outcome. The results we saw were more than encouraging and we decided to put in the time and effort to duplicate the model. That model has become Sea Services North America, LLC. We recognize Ørsted's	

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	commitments to fishermen as being the first to offer a substantial commercial contract that includes local fishermen to provide scout and safety vessels on the Sunrise Wind project. We completed thousands of miles of scouting with no issues and with that success it is providing further opportunities to commercial fishermen as guard vessels. That effort was rewarded with contracts that will supplement fishermen's revenue that is capped by regulations and quotas. That new revenue source comes at a cost. Learning the technology, upgrading health, safety and environmental standards and actually doing the work is required. The opportunities are very real and with Orsted's commitment, this is not a zero-sum game. It can be a win win. We strongly urge you to move the Sunrise Wind project forward with all appropriate speed. Sincerely, Gary Yerman New London Seafood Distributors 114 Smith Street New London, CT 06320 Cell 860-227-7283	
BOEM-2022-0071-0015	I support it fully...construction always has some impacts but look at what the impacts are. We need to address our energy problems and stop continuing with fossil fuel. It's time for a change , wind power is the clear way to move forward and the time is now..	Thank you for your comment.
BOEM-2022-0071-0018	As an organization that is part of the developing U.S offshore wind industry supply chain, we support the Sunrise Wind Project. we believe that the Sunrise Wind Project will benefit the U.S. economy, environment, and our nation's energy security. We urge you to favorably review this project on its current timeline and keep our industry developing and progressing. Dear Program Manager, We are writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. Woods Hole Group offers over 35 years of experience of solving environmental problems, by providing data and support services, with a focus on serving clients along the coast, in the ocean, and in wetland and terrestrial environments. Relying on service, technical excellence and leadership, Woods Hole Group employs experienced engineers, scientists, and technicians. Initially formed in 1986, Woods Hole Group has nearly 100 employees between corporate headquarters in Massachusetts and client-centered regional offices	Thank you for your comment.

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	in Delaware, Maryland, and Texas. As part of the global CLS Group of companies, Woods Hole Group offers a broad range of services and expertise to benefit our clients and teaming partners. We have a real opportunity to build the future of the energy industry in our country. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the chance to create a green economy that will help to preserve and sustain our planet and deliver the next generation a cleaner environment and stronger future. It is a rare chance to get in on the ground floor of an economic revolution. This is our opportunity to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that we believe BOEM should not consider – No Action. No Action could hinder further development of the developing U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, in a timely manner. Sunrise Wind will benefit the economy, environment, and our nation's energy security. We urge you to favorably review this project on its current timeline and keep our industry progressing.	
BOEM-2022-0071-0019	February 9, 2023 Local 338 RWDSU/UFCW, a labor union that represents over 13,000 men and women employed in a variety of different industries across New York State, including, food retail, pharmaceutical retail, health care and human services, transportation, agriculture, and cannabis. As a labor organization, we strongly support offshore wind developments. Large scale utility development like Sunrise Wind and other offshore wind projects will not only reduce our carbon footprint but will also mean a tremendous amount of economic opportunity in the form of jobs and economic benefits. We strongly believe that Americans should not have to choose between a good job and a clean environment –	Thank you for your comment.

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	we can and must have both. Furthermore, Offshore wind is urgently needed in the U.S. There is a huge coastal electricity demand and there is a world class resource on a large buildable continental shelf off the Northeast coast. Sunrise Wind is an important project for the nation's offshore wind industry. The comprehensive Draft Environmental Impact Statement outlines this in great detail. This project has gained deep and diverse stakeholder support among local, environmental and many labor organizations on Long Island as it has delivered on its economic commitments over the past several years. There was no opposition to the certification conditions for Sunrise Wind's transmission line which was drafted during the Article VII siting process by the New York State Public Service Commission. Orsted and Eversource's Sunrise Wind project is a broadly supported opportunity to not only drive the nation's clean energy future, but create quality, family sustaining jobs at the same time. Local 338 RWDSU/UFCW urges BOEM to move the Sunrise Wind project forward.	
BOEM-2022-0071-0020	As someone who has lived on Long Island for over 70 years, I believe that the offshore wind project is essential for the continued growth of the Long Island Community. The project is endorsed by local environmental and labor organizations. There is a constant demand for electricity and this project will provide renewable energy without pollution. I strongly urge BOEM to allow this project to move forward. This is a WIN-WIN for both the workers and residents who live in the Long Island Community.	Thank you for your comment.
BOEM-2022-0071-0022	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. Global Maritime is a leading marine, offshore and engineering consultancy. Our 20 offices around the World were involved in 7000 turbine installations across the world. In addition to this unique global experience, our US office has 20-year experience in the Offshore Industry and has been pioneering the US Offshore Wind industry with involvement in	Thank you for your comment.

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	the first US commercial farm: Block Island Wind; more recently we were awarded scopes on Coastal Virginia Offshore Wind, New England Aqua Ventus, Ocean Wind, South Fork Wind, Revolution Wind and Sunrise Wind. Based on our understanding of the positive impact of Offshore Wind internationally, and on our US experience of the industry's supply chain and labor capabilities, we are confident that carrying out the Sunrise Wind project will deliver economic and social benefits which are essential to the sustainable development of the state it is located in. We have the unique opportunity to build the future of the energy industry in our country. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working.	
BOEM-2022-0071-0023	On behalf of the Building and Construction Trades Council of Nassau and Suffolk Counites, I urge BOEM to take the necessary steps to move Sunrise Wind project forward. The Building and Construction Trades Council of Nassau and Suffolk Counties represents 65,000 members across 36 affiliated local unions. As all of our members are local, we are the true economic driver and barometer of Long Island. The offshore wind industry is imperative to the economic future of our council and subsequently our region. Sunrise Wind coupled with the other four currently awarded offshore wind projects to be sited off Long Island offers significant opportunity for economic	Thank you for your comment.

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	development and the creation of good-paying union and green-economy jobs. Long Island will establish a hub for an offshore wind workforce that will be at the center of a major industry that both strengthens our economy and combats climate change. Sunrise Wind is critical to meeting New York State's clean energy mandate which requires 70% of New York's electricity generation come from renewable energy by 2030 and calls for the development of 9,000 megawatts of offshore wind energy by 2035. Once again, I urge BOEM to move the Sunrise Wind project forward. Matthew Aracich President	
BOEM-2022-0071-0024	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As a company that has been involved in the Offshore Wind Industry since it's infancy on the east coast of the US, we are direct beneficiaries of the incredible growth opportunities offshore wind presents for companies both locally and nationally. Headquartered in NJ, Alpine has been operating in the offshore sector since 1957. We provide geophysical, geotechnical, hydrographic, environmental and oceanographic data collection services. Until offshore wind started developing in earnest on the east coast, Alpine had not seen in decades the kind of growth it encountered in the last 6 years. In the last 3 years alone, we have almost tripled in the number of people we employ and the revenue we generate. All of this growth, is due to the boom in offshore wind. The very nature of offshore wind construction, requires local manufacturing, and local employment. Alpine's growth and success is testament to what Sunrise Wind is capable of offering to the communities it touches. Offshore wind, and Sunrise Wind in particular, is uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. I am making this statement as the President and owner of a company that has long been part of the Oil and Gas industry and has profited from its participation in the fossil fuel economy. However, it is important that we seize the opportunity to take	Thank you for your comment.

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	advantage of a less damaging source of energy. Offshore Wind presents a unique opportunity to not only provide sustainable and reliable energy, but also help deal with our climate change challenges. BOEM provided six alternatives for further review. Within those six alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needsclarity and confidence that projects can move forward, and in a timely manner. That clarity generates capital investment and encourages hiring. Alpine has invested millions in equipment and hiring of staff since it became involved in the first offshore wind projects. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, and in particular the Tri-State area which as a NJ company we are part of. It is also a win for the environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working.	
BOEM-2022-0071-0028	To Whom It May Concern: My name is Esther Hernandez-Kramer. I am a teacher and a union member. As a union member, I support offshore wind. Projects like Sunrise Wind will not only reduce our carbon footprint but they will also provide economic opportunity in the form of jobs and economic benefits. Americans can and must have good jobs and a clean environment. I urge BOEM to move forward with BOEM's permitting process with regards to the Orsted and Eversource's Sunrise Wind project.	Thank you for your comment.
BOEM-2022-0071-0030	As a person who has worked in the renewable energy space for nearly 20 years, starting in solar and evolving into wind, I am proud to be involved with the Sunrise Wind project as a true pioneer of offshore wind in the US. While no solution to our energy needs is perfect, offshore wind is by far the best solution available to our energy crisis. Additionally, I see tremendous opportunities for offshore wind to evolve further into a very sustainable and beneficial practice. One of many examples is the opportunity to create structure and habitat for our marine environment. I look forward to Sunrise Wind paving the way for a cleaner and greener future for our planet.	Thank you for your comment.

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BOEM-2022-0071-0034	Dear Program Manager: I am writing to you today to express my strong support for the Sunrise Wind project. Edison Chouest Offshore ("ECO") is headquartered in Louisiana and has been in the business of engineering, constructing, owning and operating offshore marine vessels since 1960. We are recognized today as the most diverse and dynamic marine transportation solution provider in the world. ECO operates a growing fleet of almost 300 vessels, up to 525 feet in length, that serves a global customer base. ECO is the largest provider of offshore marine vessels to the U.S. offshore marine industry, the largest provider of offshore marine service vessels to the Central and South American markets and provide world-class services on every ocean, including the Arctic and Antarctic regions. ECO also operates port terminal facilities in the United States, Brazil and Guyana, where we provide terminal and logistics support services to most major offshore energy producers. Staying on the forefront of new technologies is an integral part of the ECO vision, as evidenced by recent patents and advances in the areas of emissionreduction technologies, integrated bridge systems, remote monitoring of vessel systems and global communications. The success of ECO has been built upon constructing and operating the highest quality and most technologically advanced vessels in the world, and maintain an aggressive focus on reduction of greenhouse gas emissions. ECO"s diverse fleet of vessels serves oil & gas, U.S. miliary, the river cuise industry as is currently construction the first two (2) U.S. Jones Act-compliant windfarm Service Operations Vessels (SOV). Renewable Energy is not new in the United States but offshore wind is only now at the threshold of becoming a national industry in the United States with a pipeline of over 35,000 megawatts of power across thirteen (13) states in various stages of development. In order to fully and responsibly develop each wind farm project the supply chain of required vessels, components, materials, shore facilities and human capital is enormous. The United States is uniquely positioned to build the future of the green-energy industry while creating lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the real opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. This is a rare opportunity and	Thank you for your comment.

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	ECO is proud to be a part of this revolution. BOEM has provided multiple alternatives for further review. Within those alternatives, there is one that we encourage BOEM not to consider and that is "No Action." The alternative of "No Action" would be a major impediment to the U.S. offshore wind domestic supply chain development at a critical point in this nascent industry which requires clarity and confidence that projects will move forward. ECO, and the United States, needs Sunrise Wind to be built. This project is good for the U.S. economy, the environment, and for our nation's long-term energy security. I urge you to approve this project on its current timeline and keep our industry working.	
BOEM-2022-0071-0035	Sunrise Wind coupled with four other currently awarded offshore wind projects to be sited off Long Island's shores offers significant opportunities for economic development and the creation of good-paying union jobs. Long Island can become the hub for an offshore wind workforce that will be at the center of a major industry that both strengthens our economy and fights climate change. I urge BOEM to allow the permitting process to move forward by approving Sunrise Wind's Draft Environmental Impact Statement.	Thank you for your comment.
BOEM-2022-0071-0037	As a resident of mastic Beach, a single father of three and a person struggling to make ends meet, I want to express my support for the sunrise wind farm. I worry about the world my kids are growing up in and the uncertainty of our resources like clean water, affordable costs of living and our dependence on fossil fuels. This is the only logical path to a cleaner and more sustainable future. We need this project to lead the way to more like it.	Thank you for your comment.
BOEM-2022-0071-0039	As a resident of Aquebogue, I am writing in support of Sunrise Wind. Offshore wind is a critical path to clean energy and opportunity here in New York. Sunrise Wind will create hundreds of jobs to generate enough clean energy for nearly 600,000 homes each year. Please allow this project to move forward so we can realize its immense benefits. Thank you.	Thank you for your comment.
BOEM-2022-0071-0040	The urgent need for offshore wind for Long Island becomes more apparent each day. The rate that the seas rise is not due to nature, but due to human activity. Sunrise	Thank you for your comment.

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	Wind can help to minimize it. There is also a great opportunity off our shores to generate electricity from a renewable resource just miles away. I support Sunrise Wind Farm. We all should.	
BOEM-2022-0071-0041	The New York League of Conservation Voters is a New York statewide advocacy organization committed to renewable energy and a clean energy future. Offshore wind is a top priority for us. Offshore wind is critical to meet New York's and the Country's renewable energy goals, reduce our reliance on fossil fuels and rebuild around a green energy economy, which will provide family-supporting jobs and improve public health. New York has committed to 70% renewable energy by 2030 and 100% clean energy by 2040, including 9,000 megawatts of offshore wind by 2035. But we won't meet our goals if we only talk about clean energy. It must be turned into reality with real projects on the ground. Sunrise Wind is key to meeting these goals. Sunrise Wind brings significant environmental and economic benefits. This project will generate enough clean energy to power approximately six hundred thousand homes, and will eliminate the generation of more than fifty million tons of CO2 over the project's lifetime by displacing polluting fossil fuel power. Beyond the environmental benefits, Sunrise Wind will promote clean, reliable, and safe development of domestic energy sources and clean energy job creation. Hundreds of millions of dollars will be invested, and more than eight hundred jobs will be created, including family-sustaining union jobs. The Sunrise Wind team have been nothing short of amazing partners in this process,	Thank you for your comment.

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	making every effort to receive and implement community feedback. This shows in the DEIS report where the majority of the impacts identified are moderate or below, with many important benefits as well. The New York League of Conservation Voters supports the Sunrise Wind Project and encourages the speedy advancement of the project. Thank you for the opportunity to comment on this important project.	
BOEM-2022-0071-0042	I support the Sunrise Wind, LLC"s proposed wind farm. We need to accelerate the clean energy transition. As a resident of NYState, I want to reduce our reliance on all dirty and polluting and nonrenewable energy sources. I drive an electric car which I charge with my solar panels and want to see our state act as a leader in this necessary and beneficial transition.	Thank you for your comment.
BOEM-2022-0071-0043	We need to use every arrow in our quiver to reduce our dependence on fossil fuels. Mother nature has provided many opportunities for us to live a more sustainable life. Technology and leadership should be the main drivers of change.	Thank you for your comment.
BOEM-2022-0071-0047	I am a resident of Glen Head, NY (Long Island) and fully support the Sunrise Wind Farm Offshore. I am an Energy consultant and have studied wind generation as part of my consultancy and for my Masters Degree in Energy Management. I am not at all involved in the Sunrise Wind Farm. Diversifying our energy supply and converting to renewable energy sources are essential to a sustainable energy future.	Thank you for your comment.
BOEM-2022-0071-0050	Sunrise Wind coupled with four other currently awarded offshore wind projects to be sited off Long Island’s shores offers significant opportunities for economic development and the creation of good-paying union jobs. Long Island can become the hub for an offshore wind workforce that will be at the center of a major industry that both strengthens our economy and fights climate change. I urge BOEM to allow the permitting process to move forward by approving Sunrise Wind’s Draft Environmental Impact Statement.	Thank you for your comment.
BOEM-2022-0071-0051	Hello, My name is Joseph O.Kommer and I reside in Riverhead NY as a permanent resident. I am a long term resident of the east end of Long Island and spent the	Thank you for your comment.

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	previous 30 plus years teaching Environmental and Marine Science to students at Westhampton Beach High School. Both my time as a teacher and my time before that as a student of marine and environmental sciences across the US has brought me to strongly support the Sunrise Wind Farm Offshore generation project. It is incumbent upon BOEM, NMFS, USFW and the USCorps of Engineers to maintain vigilance in identifying and mitigating foreseen and unforeseen adverse impacts. All development has negative impacts. In such environments as the continental shelf and the waters surrounding it is of the utmost necessity to implement those plans necessary to protect those resources and to do so into perpetuity. It must continue to be a paramount concern as we (society) begin to transition to alternative energy sources in our changing world. The necessity of developing these resources does not mean it can be done cheaply or with impunity. We do however have the best of experience in developing offshore projects based upon development of petroleum resources in areas like the North Sea and the Gulf of Mexico. That experience is replete with success in extraction and success in mitigating even the horrific effects of marine spills in sensitive areas. The necessity, the imperative is to do this project and set the standards for projects to follow that avoid the worst of those things and account for the others with utmost care and planning and implementation. The expertise required is already on deck. The scientific community that I know is already involved in the studies that will help characterize the organisms of greatest concern and the environments they transit or call home. It is my hope that the scientists engineers and planners do their job and that the politics and economics of developing these necessary resources work to the ultimate success of this and other projects like it.	
BOEM-2022-0071-0057	Offshore wind is urgently needed in the U.S. There is a huge coastal electricity demand and there is a world class resource on a large buildable continental shelf off the Northeast coast. Sunrise Wind is an important project for the nation's offshore wind industry. The comprehensive Draft Environmental Impact Statement outlines this in great detail. This project has gained deep and diverse stakeholder support among local, environmental and labor organizations on Long Island as it has delivered on its economic commitments over the past several years .There was no opposition to the	Thank you for your comment.

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	certification conditions for Sunrise Wind's transmission line which was drafted during the Article VII siting process by the New York State Public Service Commission. With such broad community support, I urge BOEM to move the Sunrise Wind project forward.	
BOEM-2022-0071-0058	Offshore wind is urgently needed in the U.S. There is a huge coastal electricity demand and there is a world class resource on a large buildable continental shelf off the Northeast coast. Sunrise Wind is an important project for the nation's offshore wind industry. The comprehensive Draft Environmental Impact Statement outlines this in great detail. This project has gained deep and diverse stakeholder support among local, environmental and labor organizations on Long Island as it has delivered on its economic commitments over the past several years .There was no opposition to the certification conditions for Sunrise Wind's	Thank you for your comment.
BOEM-2022-0071-0059	Construction of the Sunrise Wind project will be performed under a Project Labor Agreement and create more than 800 direct jobs and over 1200 indirect jobs in New York. Creating union jobs will boost our local economies and provide opportunities for the next generation of workers through apprenticeship training. I urge BOEM to permit this project and put our men and women in the building trades to work.	Thank you for your comment.
BOEM-2022-0071-0061	I am writing today because the jobs this will bring to our membership and future membership will be significant and it will be a great boost to the local community's through out New York state. Teamsters Local 294 is in full support of this project.	Thank you for your comment.
BOEM-2022-0071-0071	Program Manager: I write on behalf of the 10,000 members of Local 1102 RWDSU/UFCW. Many of our union members and their families live on Long Island and in the Tri-State area. As a diverse union, we know that a forward-looking economy is the best way to empower working people. The Sunrise Offshore Wind Project is exactly the type of development that our members are seeking. Firstly, Local 1102 members support efforts to use the renewable resources at our fingertips to reduce our reliance on fossil fuels. After seeing the devastating effects of climate change with weather events such as Superstorm Sandy, our members and their families are ready to power the transition to a green economy. As a region and as a nation we should strive to lead	Thank you for your comment.

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	on these technologies and systems to initiate a clean energy revolution. It is the right choice both economically and environmentally. The Sunrise Wind Project, led by the Orsted and Eversource joint venture, is a huge step in the right direction. Moreover, this project brings indirect opportunities beyond the clean energy jobs alone. With a new industry to meet New York State's 70% clean energy by 2030 goal, thousands of jobs will be needed to service, feed, and clothe the workers making the Sunrise Wind Project operational. With labor-management already cooperating, the Orsted/Eversource venture will boost local economies for generations to come with good, union jobs. We must take action to reshape our economy and energy system in the fight against climate change. The Sunrise Offshore Wind Project is a perfect step forward and Local 1102 proudly stands with this project's diverse stakeholder group. We strongly urge BOEM to move forward with Sunrise Wind's permitting process.	
BOEM-2022-0071-0072	Program Manager Office of renewable Energy Bureau of Ocean Energy Management, Offshore wind is urgently needed in the U.S. There is a huge coastal electricity demand and there is a world class resource on a buildable continental shelf off the Northeast coast. Sunrise Wind is an important project for the nation's offshore wind industry. Construction of the Sunrise Wind project will be performed under a project Labor Agreement and create more than 800 direct jobs and over 1200 indirect jobs in New York. As a union member, I support offshore wind. Large scale utility development like Sunrise Wind and other offshore wind projects will not only reduce our carbon footprint but will also mean a tremendous amount of economic opportunity in the form of jobs and economic benefits. Creating union jobs will boost our local economies and provide opportunities for the next generation of workers through apprenticeship training. I urge BOEM to permit this project and put our men and women in the building trades to work. In Solidarity, Michael Gendron CWA 1109	Thank you for your comment.
BOEM-2022-0071-0073	I'm a big supporter of the offshore wind and the Sunrise Wind project. I live in Holbrook, Town of Islip. We need to transition from fossil fuels to renewable energy for the sake of our children and grandchildren. We need to forward not backwards Thank you, Adelaide Fenton	Thank you for your comment.

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BOEM-2022-0071-0075	The planned Sunrise Wind offshore wind project will bring jobs, training and economic benefits directly to union families and local communities.	Thank you for your comment.
BOEM-2022-0071-0076	Off shore wind farms will provide a huge boost to the upstate economy that is needed so much and provide a lot of good union jobs	Thank you for your comment.
BOEM-2022-0071-0078	The only way we are going to get the US to be self-reliant in regards to energys is via Offshore Winds. For now and the future, for my children, and their children, and their grandchildren. Please! For the love of God and life!	Thank you for your comment.
BOEM-2022-0071-0079	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. Boskalis is a leading global dredging and offshore contractor and maritime services provider. We offer a unique combination of experts, vessels and activities. We have been operating globally for over 100 years, with a strong base in the US for the last 40 years. In addition to our traditional dredging activities we offer a broad range of maritime services for the offshore energy and renewables sectors. Boskalis positively contributes to climate change mitigation by helping to expand access to renewable power and by facilitating the energy transition by developing infrastructure to deliver affordable and clean energy. Our safety and those of our broader team is paramount. Boskalis operates its progressive global safety program No Injuries, No Accidents (NINA), which is held in high regard in the industry and by our clients. By leveraging our expertise in the renewables sector, we have the unique opportunity to help build the future of the energy industry. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for	Thank you for your comment.

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	further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working. Sincerely, Jared Dent Project Director Sunrise Wind	
BOEM-2022-0071-0080	Expanded offshore wind infrastructure is essential if our country is to meet its climate goals and protect its natural environment for years to come. Clean energy is the future and the federal government should be supporting clean energy projects in any and all ways that it's able to. While potential environmental impacts of such structures are valid concerns, there are methods where the impacts of such structures can be reduced. This results in a situation where the environmental benefits vastly outweigh its disadvantages. As a New Yorker in a coastal community, I completely support this project.	Thank you for your comment.
BOEM-2022-0071-0082	I am resident of Stony Brook and I am in support of this program. We do have to ensure that this project gets completed on time and under/on budget. Offshore winds farm will provide clean, renewable power and will help us reach our decarbonization goals!	Thank you for your comment.
BOEM-2022-0071-0084	As a resident of Baiting Hollow in Suffolk County, NY I support offshore wind and the Sunrise Wind project. This project will help New York transition from fossil fuels to renewable energy and create many sustainable jobs. It will be located over 30 miles offshore and connect in Brookhaven to bring renewable energy directly to 600,000 Long Island homes. I support this project.	Thank you for your comment.
BOEM-2022-0071-0085	Dear Program Manager, As a resident of Sagaponack and Mount Kisco, New York, I am writing to strongly urge the BOEM to approve the permit application for Sunrise Wind so that we can begin to realize the benefits of this regionally significant clean energy project as soon as	Thank you for your comment.

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	possible. We can't fight climate change without transitioning away from fossil fuels to renewable energy. Time is of the essence, and we have to do everything in our power to make this a cleaner and safer world for our children. And we must continue to support offshore wind for our national energy security. Thank you so much in advance for your time.	
BOEM-2022-0071-0086	Sunrise Wind coupled with the other four currently awarded offshore wind projects to be sited off Long Island offers significant opportunity for economic development and the creation of good-paying union and green-economy jobs. Long Island can become a hub for an offshore wind workforce that will be at the center of a major industry that both strengthens our economy and combats climate change. Sunrise Wind is critical to meeting New York State's clean energy mandate which requires 70% of New York's electricity generation come from renewable energy by 2030 and calls for the development of 9,000 megawatts of offshore wind energy by 2035. I urge BOEM to move the Sunrise Wind project forward.	Thank you for your comment.
BOEM-2022-0071-0087	Dear Program Manager, As America is shifting its focus to a sustainable long term energy source, so are we at LJUNGSTROM. We are a 100-year-old company that has its roots embedded deeply into the fossil fuel industry. LJUNGSTROM recently has planted a new seed, so to speak, into fabricating secondary steel for the Offshore Wind Energy markets. This new opportunity has not only transformed our business, but also the community around us, here in Wellsville, NY. This new market has enabled us to make some vast improvements to our factory. These improvements include a state-of-the-art climate-controlled coating facility, a Computer Numeric Controlled Structural cutting machine, and several other machines dedicated to delivering results in this Offshore Wind Energy market. This Offshore Wind market also has enabled us to hire over 75 new employees, over the last year, to help meet the demands of these new contracts. And this is just the start, as we are looking forward to hiring another significant number of new employees this year. These are exciting times for everyone in Wellsville! So, to say that LJUNGSTROM supports the Sunrise Wind project, is an understatement. We are a part of Sunrise Wind! Because of projects like Sunrise Wind, we can employ hundreds of great people and help them provide for their families and	Thank you for your comment.

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	the community. Please keep this project moving forward, on-time, because our future needs to be greener, sooner rather than later!	
BOEM-2022-0071-0088	I totally support this project! We need more clean and renewable energy in the USA!	Thank you for your comment.
BOEM-2022-0071-0089	I am writing in support of the Sunrise Wind Project. This is a positive step away from fossil fuels. It will help us achieve our NYS goals toward renewable energy. Personally, I think the modern windmills make a beautiful landscape element. The arguments against this project, noise, bird death, and disrupting the view from land are unfounded. I have actually walked in a windfarm (on land) and yes, there is noise when you are in the midst of the windmills. But, in the car parked on the road beside the farm, with the windows up it was quiet. A short walk from the farm, there was no noise. The farm in this instance is distant from land and, as I said above, I think it will add visual interest. Yes, there are some instances of bird death, but they are relatively few and there are way to manage and minimize the problem. I believe more birds die from being caught by cats at bird feeders; we have not yet prohibited either bird feeders or cats.	Thank you for your comment.
BOEM-2022-0071-0090	As life long east end resident, I wholeheartedly support the Sunrise Wind project. Energy independence is a critical issue for eastern LI. Our kids and future depend on us taking the meaningful steps towards renewable non-fossil based energy. PEASE APPROVE THIS PROJECT!	Thank you for your comment.
BOEM-2022-0071-0091	Offshore wind will reduce our reliance on fossil fuels and will provide family-supporting jobs and improve public health. New York has committed to 70% renewable energy by 2030 and 100% clean energy by 2040, including 9,000 megawatts of offshore wind by 2035. But we won’t meet our goals if we only talk about clean energy. It must be turned into reality with real projects on the ground. Sunrise Wind is key to meeting these goals	Thank you for your comment.
BOEM-2022-0071-	As a member and recent honoree of the New York League of Conservation Voters for	Thank you for your

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0093	our dedication to supporting the preservation of our environment, I would encourage you to support the development of the proposed wind farm offshore New York (aka Sunrise Wind). Being in the business of offering a total turnkey solution to providing EVSE charging infrastructure, and also being an owner/operator of several Long Island charging ports, we clearly recognize the need for available electrical energy in volume far beyond what we have utilized in the past. Further, the demand for electricity to support our charging station as well as hopefully thousand more in New York can only benefit from the availability of wind farm harnessed energy supported by appropriate and ample battery storage facilities. Without them, the costs of dispensed electricity as impacted by demand charges will stifle innovation and prevent businesses from being able to afford to transition to clean energy.	comment.
BOEM-2022-0071-0095	Make it happen, we need it! China is way ahead of us in renewable energy and we are the richest country in the world.	Thank you for your comment.
BOEM-2022-0071-0096	I support approval for the Sunrise Wind Farm construction. Offshore wind is essential for New York to achieve its atmospheric-carbon-reduction goals. The location of the wind farm takes into consideration the aesthetics of seashore beauty by siting the windmills far enough offshore.	Thank you for your comment.
BOEM-2022-0071-0098	We are in a crisis regarding both energy and climate change. We need to taper off using fossil fuels and go green	Thank you for your comment.
BOEM-2022-0071-0099	I think this is a good idea--one whose time has come. We need to reduce our use of fossil fuels, whether by uses of solar panels, solar wind farms, electric cars or heat pumps.	Thank you for your comment.
BOEM-2022-0071-0100	We need more offshore wind to hope to achieve our clean energy goals and create a healthier, more stable future for our children. As a resident of Yonkers, I write to urge BOEM to approve the permit application for Sunrise Wind so that we can begin to realize the benefits of this regionally significant clean energy project as soon as possible. We can't fight climate change without transitioning away from fossil fuels to renewable energy as a major investment supported by our State, and the nation.	Thank you for your comment.
BOEM-2022-0071-	Offshore wind will substantially aid out transition from fossil fuels to offshore wind as	Thank you for your

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0102	our cleaner source of energy. The work that NYLCV is doing to support clen energy is going to have a material effect on the futures of all of us, without your efforts, our beautiful island could eventually become inhabitable. Keep up the good work. Ray LeCann,	comment.
BOEM-2022-0071-0103	Our future as American's lies with creating substainable clean energy sources such as wind turbines.	Thank you for your comment.
BOEM-2022-0071-0104	As a New Yorker, I support the Sunrise Wind project and associated wind power projects across our state's land and waters. Local, clean energy is the best way to keep New York's power grid safe amidst the growing climate crisis and the provocations of petro-states such as Russia. Sunrise Wind is an investment in the future of our state that will pay off immeasurably in the long run.	Thank you for your comment.
BOEM-2022-0071-0105	I support Sunrise Wind and the offshore wind projects that will help support our union jobs!	Thank you for your comment.
BOEM-2022-0071-0107	I am in full favor of the Sunrise Wind Farm Offshore New York.	Thank you for your comment.
BOEM-2022-0071-0108	The Sunrise Wind project is vital to our community! As a mother, I believe this project is vital to our community! It will help New York transition from fossil fuels to renewable energy, save Long Islanders money and most importantly help reduce carbon emissions and work to protect the environment for our children. The Not-in-my-backyard argument doesn't make sense because it will be located over 30 miles offshore and it will bring renewable energy directly to 600,000 Long Island homes. I support this project because clean energy is important to our future!	Thank you for your comment.
BOEM-2022-0071-	We need to invest in clean energy immediately!	Thank you for your

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0109		comment.
BOEM-2022-0071-0111	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. Having been employed in the fishing industry for over a decade has shown me the bountiful resources that can be sustainably harvested from our oceans and wind energy will be no different. The wind projects, while I was at first skeptical of how it would impact the fishing industry, have proven to be a job multiplier for numerous individuals like myself. The growing employment opportunities created by projects like this one have provided outlets for individuals in a plethora of trades to transition into this rising job market. Also, it has been made apparent that projects utilizing Fisheries Liaison Officers have made every best effort available to minimize any potential impacts within the local fishing communities. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working. Sincerely, Fisheries Liaison Officer	Thank you for your comment.
BOEM-2022-0071-0112	Writing in support of this wind project which will provide jobs and clean energy to New Yorkers!	Thank you for your comment.
BOEM-2022-0071-0113	Sunrise Wind - Offshore wind is indispensable to New York's clean energy future and we encourage NYLCV members and everyone who cares about clean energy to speak up for offshore wind!	Thank you for your comment.

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	Offshore wind will reduce our reliance on fossil fuels and will provide family-supporting jobs and improve public health. New York has committed to 70% renewable energy by 2030 and 100% clean energy by 2040, including 9,000 megawatts of offshore wind by 2035. But we won't meet our goals if we only talk about clean energy. It must be turned into reality with real projects on the ground. Thank you	
BOEM-2022-0071-0114	I am writing to express my full support of this project.	Thank you for your comment.
BOEM-2022-0071-0118	To be brief, if the benefits out weigh the costs to birds, fish undersea habitats I am for it.	Thank you for your comment.
BOEM-2022-0071-0119	A sustainable New York needs clean energy. Let's invest in our State's clean energy future. Let's not rely on fossil fuels any longer than necessary. Long Islanders at ready to harness the wind's power and embrace a clean, sustainable future.	Thank you for your comment.
BOEM-2022-0071-0121	We have to start now to do something to help our environment and get away from oil forts too late.	Thank you for your comment.
BOEM-2022-0071-0122	Over the past 30 years, we have lost 50% of Earth's coral reefs. The scientific consensus indicates that the primary cause of this is climate change brought on by global warming. Wind power is undeniably a solution. Wind power, specifically offshore wind power, is one the most efficient sources of renewable energy production humans have ever created. As we begin to phase out of our dwindling supply of conventional & harmful fossil fuels, utility energy production needs to be powered by renewable sources. I encourage all permitting entities to help propel the USA to achieve this accomplishment.	Thank you for your comment.
BOEM-2022-0071-0123	I love the idea of offshore wind farms, assuming that due diligence is taken to ensure all environmental guidelines are followed and scientists are actively tracking the impacts of these farms in the short, medium and long term on ocean ecosystems.	Thank you for your comment.
BOEM-2022-0071-0124	Just Build it and stop "Pussy Footing" around. This is a needed project that will help relieve the nation of some economic and environmental woes!!!!	Thank you for your comment.
BOEM-2022-0071-	I am in strong support of renewable energy and offshore wind. Please allow the	Thank you for your

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0129	Sunrise Wind project to proceed!	comment.
BOEM-2022-0071-0130	I support expanding offshore wind projects	Thank you for your comment.
BOEM-2022-0071-0132	I live on eastern Long Island and have for 78 yrs. I think this offshore wind farm is a major asset for this area and any others it may service. I have sailed past oil derricks in the ocean and these windmill are a lot safer in many ways.	Thank you for your comment.
BOEM-2022-0071-0133	Attention of US Bureau of Ocean Energy Management Re :Sunrise Wind Project for New York My name is Kevin Cawley, and I am the Director of the Thomas Berry Forum for Ecological Dialogue at Iona University in New Rochelle NY. I speak in favor of the Sunrise Wind offshore wind project. Offshore wind will reduce our reliance on fossil fuels and will provide family-supporting jobs and improve public health. New York has committed to 70% renewable energy by 2030 and 100% clean energy by 2040, including 9,000 megawatts of offshore wind by 2035. But we won't meet our goals if we only talk about clean energy. It must be turned into reality with real projects on the ground. Pope Francis has noted in Laudato Si, his encyclical letter on care for our common home: "There is an urgent need to develop policies so that, in the next few years, the emission of carbon dioxide and other highly polluting gases can be drastically reduced, for example, substituting for fossil fuels and developing sources of renewable energy." (LS 26) The United Nations Intergovernmental Panel on Climate Change says that avoiding catastrophic climate change requires keeping global average temperatures within 1.5 Celsius degrees above pre-industrial levels. We need to switch to renewable sources for electricity now to avoid this temperature rise. The connectivity question must also be addressed. To get all this electricity from where it will be generated to where it is used, we also need a massive expansion of transmission—a tripling or quadrupling in capacity under some scenarios. Several studies conclude that achieving the need- ed level of wind and solar requires building on the order of 100 gigawatts a year out to 2050. To put this in perspective, one good-	Thank you for your comment.

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	sized nuclear power plant, or a very large wind farm, has a capacity of about 1 gigawatt. So, we would have to build the equivalent of around 100 similar projects every year to meet the energy needs we know will be upon us. The clock is ticking. Again, Pope Francis reminds us: "Results take time and demand immediate outlays which may not produce tangible effects within any one government's term. That is why, in the absence of pressure from the public and from civic institutions, political authorities will always be reluctant to intervene, all the more when urgent needs must be met. To take up these responsibilities and the costs they entail, politicians will inevitably clash with the mindset of short-term gain and results which dominates present-day economics and politics. But if they are courageous, they will attest to their God-given dignity and leave behind a testimony of selfless responsibility. " (LS 181) I urge the Bureau of Ocean Energy Management to support the Sunrise Wind project and do everything in its power to expedite the rapid completion of this essential infrastructure. Br. Kevin Cawley, Thomas Berry Forum at Iona University, February 14, 2023	
BOEM-2022-0071-0134	I support the wind project to help New York get off fossil fuels and use natural resources to generate power. By carefully locating wind farms offshore where it won't be disruptive visually or otherwise, it is a win/win for all New Yorkers and world citizens!	Thank you for your comment.
BOEM-2022-0071-0135	Any moves toward renewable energy in all forms should be lauded and encouraged. After reading about wind farming, I can't seem to find a credible adverse effect when implemented correctly. It seems like a no-brainer. As a native East Ender, I enthusiastically support this initiative and can't wait to see it come to fruition. Let"s go!	Thank you for your comment.
BOEM-2022-0071-0136	What happens to the wind turbines when there life expectancy is done?	Thank you for your comment.

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BOEM-2022-0071-0137	Offshore wind w'll greatly reduce our dependence on fossil fuels. I support Sunrise Wind project off Long Island.	Thank you for your comment.
BOEM-2022-0071-0138	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As the US grows its offshore wind industry, we can shape the future of the energy market in the United States. Riggs Distler & Company, Inc. has grown over the past century into one of the largest union utility, mechanical, and electrical contractors in the United States. With talented leadership and mentoring at all levels, we promote a safe, exciting, and challenging work environment. Our philosophy is to empower employees to grow and evolve with our business—all with union support. We are proud of our strong connection and reputation with local suppliers to provide economic opportunities for surrounding area businesses as we continue to build the local supply chain needed to support the offshore wind industry as general contractor in multiple states in the Northeast. This project is a chance to make a lasting impact through the creation of new relationships, supply lines, and markets to build reliable and innovative infrastructure to support and empower future generations. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working. Sincerely, Stephen M. Zemaitatis Jr. President & CEO Riggs Distler & Company, Inc.	Thank you for your comment.
BOEM-2022-0071-0140	Full speed ahead with offshore wind in the USA, especially in the New York bite. Site onshore facilities in a variety of states to share job growth- but make the system cohesive. Coordinate permitting and fast track them. Aggregate Environmental Impact reviews so that other projects can use the same data. Make it easier for more US companies to get into the offshore wind game. It is pathetic that we have ceded this fantastic industry to European majors.	Thank you for your comment.
BOEM-2022-0071-0142	Dear Ms. Baker: On behalf of The International Brotherhood of Electrical Workers, Third District, I am writing in support of Proposed Action-Alternative B of the DEIS on Sunrise Wind's COP. Nationally, the IBEW represents 775,000 active members and retirees who work in a wide range of fields, including utilities, construction, telecommunications, broadcasting, manufacturing, railroads, and government. These	Thank you for your comment.

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	members include approximately 55,000 workers in New York State. We stand with President Biden's Executive Order 14008 and New York State in its commitment to renewable and clean energy sources, such as offshore wind. We are committed to collaborating closely with partners across all levels of government, and the private sector, to achieve the President's and Governor Hochul's clean energy goals. We are committed to ensuring that sustainable energy projects occurring within the United States are designed and built to minimize their impact on the environment, with safety as a top priority, and to support IBEW members with safe, family-sustaining jobs. Sunrise Wind is a joint venture between Orsted, the world's most sustainable energy company, and a global leader in offshore wind energy, and Eversource, New England's largest and premier energy delivery company to provide more than 1000 megawatts of clean, renewable energy to New York State. The Sunrise Wind project will provide a significant contribution to the Federal and State goals of clean energy by providing the energy to power more than 600,000 homes. In addition to the critical clean energy, Orsted and Eversource have committed to utilizing union workers to construct the project. The hundreds of union jobs will provide upward mobility for working class residents of New York. The project will also encourage the development of the U.S. based supply chain for offshore wind which will lead to tens of thousands of good paying, family sustaining jobs. The IBEW has been working with both Orsted and Eversource over the last several years to better understand the offshore wind industry's needs and the ensuing workforce required for these critically important projects. These companies have clearly demonstrated their commitment to workers, and we believe this concern will translate well for environmental impact during the construction, operations and eventual decommissioning of their projects. The IBEW encourages BOEM to approve Proposed Action - Alternative B without undue delay.	
BOEM-2022-0071-0143	I support the Sunrise Wind project! Offshore wind will reduce our reliance on fossil fuels and will provide family-supporting jobs and improve public health. It seems like a no-brainer to move ahead.	Thank you for your comment.
BOEM-2022-0071-0144	I am 100 per cent in favor of wind energy. As a sailor, I know that Sunrise Wind is well located to take advantage of southwesterly summer thermals rising over Long Island.	Thank you for your comment.

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	Actually, for the benefit of the planet, and all life as we know it; we MUST wean ourselves off of fossil fuels as soon as possible. Sunrise wind is well positioned to help with this effort.	
BOEM-2022-0071-0146	I am in support of Sunrise Wind's proposal for an offshore wind farm in New York. We must replace dirty sources of power asap. The warming of our planet must be controlled, and offshore wind installations are a necessity to reaching this goal.	Thank you for your comment.
BOEM-2022-0071-0149	I support this project to build clean energy infrastructure in New York. Our state can be a climate leader.	Thank you for your comment.
BOEM-2022-0071-0150	I fully support the proposed wind farm, which will reduce our reliance on fossil fuel, provide jobs, and supply Long Islanders with energy. Please allow this project to go forward. We must do all we can to protect present and future generations from the devastating effects of climate change	Thank you for your comment.
BOEM-2022-0071-0151	My husband and I live on the North Fork of Long Island, NY, and are supporters of the offshore wind project. There are many reasons to positively consider the offshore project, but the first and most important reason is that our number one asset, the water that surrounds this island, is a resource that can help us transition to a greener power system and we have to start somewhere. Hansen and other scientists have said that 2035 is a dangerous turning point, so let's get at least something productive under way. We've talked enough.	Thank you for your comment.
BOEM-2022-0071-0152	Dear Program Manager: I write to express support for the Sunrise Wind project. The Haugland companies have been building state-of-the-art transmission infrastructure for over 20 years. We've worked on a great number complex, interesting projects throughout our history, but it would be difficult to find a project more interesting than the work to support the U.S. offshore wind industry, including Sunrise Wind. We have had the opportunity to build the onshore infrastructure for South Fork Wind, which will be complete and operational this year. We will also be working to support the construction of Sunrise Wind, a vastly larger and more complex project. We appreciate BOEM's careful consideration of the Sunrise Wind project and understand that BOEM provided six alternatives for further review. Within those six alternatives, there is one	Thank you for your comment.

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	that BOEM should not consider - No Action. Without action, New York will not realize Sunrise Wind's tremendous potential to create jobs and grow the supply chain. Sunrise Wind is good for New York's economy and the region's environment. We at Haugland Energy urge you to approve this project and keep our state's momentum going.	
BOEM-2022-0071-0155	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. Ordtek is an independent UXO Risk Management consultancy providing unparalleled expertise and guidance across the energy and construction sector. Established in 2012, acquired by Venterra in 2022 and headquartered in Norfolk, Ordtek has provided support to projects all over the world. Recent projects have been situated in Western and Northern Europe, to the USA and across several countries in the APAC region. We have the opportunity to build the future of the energy industry in America, and we are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities, that will be sought after by those looking to build their American dream, create families, and purchase homes. We can create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and the nation's energy security. I urge you to approve this project on its current timeline and keep our industry working. Sincerely, Lee Gooderham Director	Thank you for your comment.
BOEM-2022-0071-0159	As a member of the New York State carpenters local to 91 I totally support offshore wind energy that would power up to 6000 homes in the state. Please support this.	Thank you for your comment.

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BOEM-2022-0071-0165	Renewable resources are the future. There is a ticking time bomb we are still embracing that is our current dependence on fossil fuels. Renewable resources such as wind, solar, geothermal and biofuels are the only practical future for our planet, further dependence on fossil fuels will ensure there will be no future.	Thank you for your comment.
BOEM-2022-0071-0166	BOEM DEIS Hearing-Testimony Suggestions • Sunrise Wind coupled with four other currently awarded offshore wind projects to be sited off Long Island's shores offers significant opportunities for economic development and the creation of good-paying union jobs. Long Island can become the hub for an offshore wind workforce that will be at the center of a major industry that both strengthens our economy and fights climate change. I urge BOEM to allow the permitting process to move forward by approving Sunrise Wind's Draft Environmental Impact Statement. • Construction of the Sunrise Wind project will be performed under a Project Labor Agreement and create more than 800 direct jobs and over 1200 indirect jobs in New York. Creating union jobs will boost our local economies and provide opportunities for the next generation of workers through apprenticeship training. I urge BOEM to permit this project and put our men and women in the building trades to work. • As a union member, I support offshore wind. Large scale utility development like Sunrise Wind and other offshore wind projects will not only reduce our carbon footprint but will also mean a tremendous amount of economic opportunity in the form of jobs and economic benefits. I strongly believe that Americans should not have to choose between a good job and a clean environment – we can and must have both. Orsted and Eversource's Sunrise Wind project is an opportunity to not only drive the nation's clean energy future, but create quality, family sustaining jobs at the same time. I urge BOEM to move forward with BOEM's permitting process. • Sunrise Wind coupled with the other four currently awarded offshore wind projects to be sited off Long Island offers significant opportunity for economic development and the creation of good-paying union and green-economy jobs. Long Island can	Thank you for your comment.

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	become a hub for an offshore wind workforce that will be at the center of a major industry that both strengthens our economy and combats climate change. Sunrise Wind is critical to meeting New York State's clean energy mandate which requires 70% of New York's electricity generation come from renewable energy by 2030 and calls for the development of 9,000 megawatts of offshore wind energy by 2035. I urge BOEM to move the Sunrise Wind project forward. • Offshore wind is urgently needed in the U.S. There is a huge coastal electricity demand and there is a world class resource on a large buildable continental shelf off the Northeast coast. Sunrise Wind is an important project for the nation's offshore wind industry. The comprehensive Draft Environmental Impact Statement outlines this in great detail. This project has gained deep and diverse stakeholder support among local, environmental and labor organizations on Long Island as it has delivered on its economic commitments over the past several years .There was no opposition to the certification conditions for Sunrise Wind's transmission line which was drafted during the Article VII siting process by the New York State Public Service Commission. With such broad community support, I urge BOEM to move the Sunrise Wind project forward.	
BOEM-2022-0071-0169	Dear Program Manager: I strongly support approval of the DEIS for Sunrise Wind's Construction and Operations Plan, Alternative B - Proposed Action. The IBEW"s members and leadership in New York and in our 3rd District have been deeply involved in supporting the offshore wind industry over the last several years and are preparing our already well trained workers with skills necessary to work in the offshore industry. We anticipate hundreds of high paying, quality jobs in the offshore industry with partners such as Orsted and Eversource. These companies have committed to safety and environmental responsibility and have demonstrated their commitment in those critical areas very well to date. As noted in the DEIS, Alternative C-1 could be a viable option to reduce certain fish habitat impact from moderate to minor but it is unclear upon my review what the commercial viability of such change would be on the project. Please move forward with the approval of Alternative B - Proposed Action without	Thank you for your comment.

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	delay.	
BOEM-2022-0071-0171	Program Manager: I write on behalf of the 10,000 members of Local 1102 RWDSU/UFCW. Many of our union members and their families live on Long Island and in the Tri-State area. As a diverse union, we know that a forward-looking economy is the best way to empower working people. The Sunrise Offshore Wind Project is exactly the type of development that our members are seeking. Firstly, Local 1102 members support efforts to use the renewable resources at our fingertips to reduce our reliance on fossil fuels. After seeing the devastating effects of climate change with weather events such as Superstorm Sandy, our members and their families are ready to power the transition to a green economy. As a region and as a nation we should strive to lead on these technologies and systems to initiate a clean energy revolution. It is the right choice both economically and environmentally. The Sunrise Wind Project, led by the Orsted and Eversource joint venture, is a huge step in the right direction. Moreover, this project brings indirect opportunities beyond the clean energy jobs alone. With a new industry to meet New York State's 70% clean energy by 2030 goal, thousands of jobs will be needed to service, feed, and clothe the workers making the Sunrise Wind Project operational. With labor-management already cooperating, the Orsted/Eversource venture will boost local economies for generations to come with good, union jobs. We must take action to reshape our economy and energy system in the fight against climate change. The Sunrise Offshore Wind Project is a perfect step forward and Local 1102 proudly stands with this project's diverse stakeholder group. We strongly urge BOEM to move forward with Sunrise Wind's permitting process. Sincerely, Alvin Ramnarain President	Thank you for your comment.
BOEM-2022-0071-0177	Living on Long Island is costly. Please consider this when setting working standards for local projects that are publicly funded thank you.	Thank you for your comment.
BOEM-2022-0071-0184	It's good for the planet, labor, jobs, economy. Please allow it to go through	Thank you for your comment.
BOEM-2022-0071-	As a member of local 25 IBEW I'm in full support of this very important project. the	Thank you for your

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0186	changes that the world is undergoing is far reaching and every one of us has to decide what is best not just for ourselves but our families, communities and the environments inwhich we live in. We have to give our children a advantage to succeed and achieve far more than we have and we do this by supporting projects like the sunrise wind farm. This will provide us the opportunity to come together as a strong union to do our part in providing clean energy for a better tomorrow. thank you.	comment.
BOEM-2022-0071-0187	I would like to express my full support for the Sunrise Wind offshore wind project. This project is a big step toward a cleaner future for my children . Thank you!	Thank you for your comment.
BOEM-2022-0071-0188	I am a Local 25 I B E W electrician that lives on Long Island , New York I fully support this Sunrise offshore wind project off the shores off Long Island These are jobs that are much needed to sustain living here on the island. Not to mention that it is clean , safe and renewable source of electricity that will last for years with no carbon emissions Tommy S	Thank you for your comment.
BOEM-2022-0071-0196	I am in support of the Sunrise Wind project and think that it is long overdue. The amount of energy that can be produced cleanly is vital to the future for Long Island.	Thank you for your comment.
BOEM-2022-0071-0200	On behalf of 620 Sierra Club members and supporters in NY, I am attaching the following comment submissions. The Sierra Club is strongly supportive of this project. "We need offshore wind to meet New York's climate mandate and stop climate change from worsening. As a New Yorker, I support responsible projects like the proposed Sunrise Wind farm. Sunrise Wind will be built with New York union labor. It will deliver power to one of the key load centers of the state, Long Island, and help to displace gas power from one of the dirtiest parts of New York's grid. We need offshore wind to replace fracked gas; without it, we cannot hope to protect our sensitive marine environment, our communities, and our future. Please approve the Construction & Operations Plan for this project."	Thank you for your comment.
BOEM-2022-0071-0206	Dear Program Manager: We write to you on behalf of the members of the Business Network for Offshore Wind (the Network) to provide comments on the Sunrise Wind Draft Environmental Impact Statement [BOEM-2022-0071] published in the December	Thank you for your comment.

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	16, 2022 Federal Register. The Network is the largest nonprofit organization solely focused on the development of the offshore wind industry and its supply chain. Since 2013, the Network has brought together business and government, both domestically and internationally, to educate and to prepare companies and small businesses to enter the offshore wind market. The Network uses the voice of its members to educate and support federal, state, and local policies to advance the development of the U.S. offshore wind industry. The Network empowers its members with the education, tools, and connections necessary to participate in this booming industry. The Network commends BOEM on its decade of work bringing the Sunrise Wind project forward and recent advancement of a Draft Environmental Impact Statement as proof of the Biden-Harris Administration's clear interest in advancing the U.S. offshore wind industry. Development of the Sunrise Wind project will make important contributions towards national and state offshore wind goals and the establishment of a local supply chain. Advancement of this project is in the declared public interests of the United States and the state of New York. Presidential Executive Order No. 14008, issued on January 27, 2021, states it is the policy of the United States to combat the climate crisis, reduce climate pollution in every sector of the economy, and spur well-paying jobs and economic growth especially through the development of clean energy technologies and infrastructure. Furthermore, the executive order specifically calls on the Secretary of the Interior to review permitting processes in offshore waters to increase renewable energy production in those waters, with the goal increasing offshore wind power in the United States to 30 GW and creating good jobs. The project is designed to contribute to New York's offshore wind energy goal. The Sunrise Wind farm is expected to begin construction soon after BOEM's approval and can begin providing necessary renewable energy to New York. Sunrise Wind is expected to begin commercial operations in late 2025 with a total capacity of up to 1,034 megawatts (MW). Sunrise Wind's annual production will be enough to power approximately 600,000 average New York homes. In addition, Sunrise Wind can play a key role in helping New York meet the state's goals outlined in the 2019 Climate Leadership and Community Projection Act. The project represents a significant step towards meeting	

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	the state's goal of 70% of the state's electricity generated from renewable sources by 2030. Moreover, Sunrise Wind will fulfill 11% of New York's overall offshore wind goal of 9,000 MW by 2035. By moving forward with the approval of the Sunrise Wind and completing the draft environmental impact statement BOEM is driving New York's offshore wind program one step closer to having steel in the water and helping the state meet its clean energy goals. The Network supports BOEM's deliberate consideration and commitment to environmental protection. The Network encourages BOEM to continue moving the Sunrise Wind project forward with the recognition of the enormous environmental and economic benefits the project offers, especially compared to a "No Action" alternative. Net reductions in air pollutant emissions resulting from the Proposed Action are expected to contribute to long term benefits for communities by displacing emissions from fossil fuel generated power plants. Sunrise Wind project as proposed would result in annual avoided emissions in NOx (1,474 tons), SO2 (1,534 tons), VOCs (106 tons), PM2.5 (471 tons), and CO2 (2,592,802 tons) (COP p 4-141) I. Sunrise Wind's Impact on the U.S. Supply Chain The Biden Administration has taken significant actions to bring transparency and predictability to the offshore wind leasing and permitting process, including the full federal permitting approval of Vineyard Wind and the issuance of the Record of Decision for South Fork Wind. BOEM and the Department of Interior are already taking steps to build that long-term pipeline by releasing a longer-term leasing plan Path Forward 2021-2025 for offshore wind leasing in U.S. waters. Just last week, the Department of Interior announced new proposed regulations that would modernize offshore wind processes in order to decrease costs and market uncertainty. In the face of growing global demand, sending clear market signals to attract investment to the U.S. is critical to ensuring U.S. offshore wind deployment goals are met. The Demand for a Domestic Offshore Wind Energy Supply Chain, a report published by NREL, studied the capacity to fulfill the administration's deployment goal of 30 GW by 2030 and found "additional facilities will be required to achieve a fully domestic offshore wind supply chain."i This fact takes on increasing importance as the report notes it is "unlikely that international suppliers will have sufficient throughput to support the construction of both European	

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	and U.S. offshore wind energy projects." Accordingly, if the U.S. does not develop a robust domestic offshore wind supply chain, surging global demand for offshore wind project components, services, and raw materials could prevent the U.S. from reaching state and federal offshore wind deployment targets. A follow-up report released earlier in 2023 found that the U.S. market would require $6 billion in new investments in factories, ports, vessels, etc., to ensure the nation matches its 30. GW buildout. And up to $22.4 billion to build out a sustainable domestic supply chain Encouragingly, actions by the Department of Interior are already driving substantial investment decisions. The Network closely tracks the market and found that public and private investors committed $2.2 billion in new funding in 2021, including commitments to develop nine major component facilities that will manufacture the foundations, towers, cables and blades of offshore wind turbines. In 2022, the market generated $5.44 billion in new lease revenues for the U.S. government, reflecting an increased investor confidence in the U.S. market which will be crucial to a full build-out of the U.S. industry. Advancing Sunrise Wind is crucial to maintaining this momentum. The global offshore wind industry is growing exponentially, which will further strain global supply chains. In 2021, market analysts predicted global offshore wind capacity would reach 270 GW by 2030, in line with Network calculations of 254 GW by 2030. With only 57.2 GW installed by the end of 2021 (after 30 years of offshore wind development) the global market was facing a steep installation curve in order to reach established targets. Many nations have accelerated their timelines often in response to the Russian invasion of Ukraine. Denmark, Belgium, the Netherlands and Germany agreed to increase their offshore wind capacity "fourfold" by 2030 – equating to 50 GW of new capacity in nations with only 15 GW currently installed. British Prime Minister Boris Johnson called for increasing his nation's targets to 50 GW by 2030, a 25% increase over current targets. According to Renewable UK, the global pipeline of offshore wind demand doubled in a year. Actions that delay project timelines must be avoided to the greatest extent possible. Project investments are ongoing and demand for materials, skilled labor, and critical equipment is dependent upon timely implementation. The Network urges BOEM to advance the Sunrise Wind project on its	

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	timeline. Direct Benefits to New York and the U.S. Supply Chain In building out offshore wind in the U.S., Sunrise Wind project developer Orsted has invested $2 billion into the U.S. economy and has a supply chain touching upon 41 sates. (See https://us.orsted.com/our-impact/supply-chain) The proposed project is already directly contributing to the formation of a U.S. supply chain, and major investments are dependent on its advancement. The port investment alone will have substantial impacts on redevelopment efforts in two different regions in New York as well as in the State of Connecticut. Construction and operation of Sunrise Wind will create more than 800 direct jobs and over 1200 indirect jobs in New York. Construction and operation of Sunrise Wind will result in direct investment of more than $400M in New York state. To bolster their commitment to the project, Sunrise Wind is providing $10 million to launch a national offshore wind training center at Suffolk Community College and $5 million for a research and development partnership with Stony Brook University. As part of the project a steel fabricator in Western New York will fabricating anode cages to create at least 100 jobs.. The anodes will be assembled with foundation components in the Capital Region, seeding a supply chain that can continue to serve additional offshore wind project creating 230 jobs at Port of Coeymans. Orsted/Eversource is creating an operations and maintenance (O&M) hub at Port Jefferson that will be the home port of a Service Operation Vessel that will support maintenance and operation of the developers' portfolio of projects in the northeast. Because of the size of this project, in addition to the two ports mentioned above, Orsted/Eversource and the federal government are investing $255 million into the Port of New London1 to develop it as a staging and assembly port and a $90 million investment at the Port of Davisville-Quonset to be used for operations and maintenance. The Sunrise Wind project is also supporting the building of the first US-built service operations vessel (SOV) and 5 crew transfer vessels; the SOV will be built by Edison Chouset's shipyards in Louisiana, Mississippi and Florida, and supplies for the vessel will be sourced in 12 states. In addition, the company has entered into a charter agreement to use the first Jones Act qualified wind turbine installation vessel, the Charybdis, a $550 million vessel being constructed in Brownsville, Texas. Additionally,	

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	the New York workforce and more broadly domestic workers will gain entry into the offshore wind workforce and receive invaluable experience to be applied in future projects. II. Comments on the Proposed Alternatives The Network begins by commending BOEM for recognizing the importance of state public policy by maintaining a commitment to achieve up to 1,034 MW with 94 WTG, delivering clean power to New York. While the Network appreciates environmental and fishing deconflicting considerations undertaken during the process including impacts to complex fish habitats, it is clear that pursuing either Alternative C1 or C2 do not offer significant benefits over Alterative B and could lead to unneeded project delays as shown in the analysis. The DEIS notes the fishing activity in the Lease Area accounts for a very small percentage (0.16 percent) of the total revenue across all fisheries covered by a Fishery Management Plan in the Mid-Atlantic and New England region. The DEIS notes that 75% of commercial vessels fishing the lease area derived less than 1% of their total annual revenue from the lease area, an incredibly low number. (DEIS 3-412). This is demonstrated by the fact that there is no change in impact to commercial and for-hire recreational fisheries when comparing the proposed Action to the two alternatives C-1 and C-2. (ES-xi). We emphasize the importance of maximizing the capacity to deliver energy from the project in order to achieve present and future commitments while reducing costs, amplifying community benefits and safeguarding the environment. Furthermore, the Network encourages BOEM to think about holistic economic and environmental impacts when considering alternatives. The Network recommends that BOEM implement the goals of Alternative B, while recognizing, based on the valuable input that BOEM has received during the process, there may be ways to improve upon the project while ensuring the timeline continues to move forward without delay. IV. Conclusion The Business Network for Offshore Wind and its members strongly encourage BOEM to maximize the ability of the lease area to generate and transmit as much electricity as possible to support the national and state of New York goals for renewable energy delivered to the grid. According to the Biden Administration, “More opportunities are ahead, including an estimated $109 billion revenue opportunity across the offshore wind supply chain this decade, and East Coast	

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	Governors are laying the groundwork to seize them. Having already set commitments to procure nearly 40 GW of offshore wind, these states are providing a strong demand signal for clean energy that will lower energy costs for American families while protecting them from volatile fossil fuel price spikes." Equally important, the Network urges BOEM to focus on avoiding delay in project implementation that could threaten already challenged supply lines and postpone needed employment. These employment opportunities will directly benefit the residents in the region in which the project is proposed. BOEM noted that "there will be notable and measurable benefits to employment, economic output, infrastructure improvements, and community services, especially job training, because of offshore wind development." The air quality and other environmental benefits resulting from expanding renewable energy resources cannot wait. The impacts of Sunrise Wind's current design are materially no different than the alternatives analyzed in the DEIS. The Network strongly recommends moving forward with the proposed action in the DEIS and approval of Sunrise Wind's COP. Very truly yours, /s/ Ross Gould Ross Gould Vice President of Supply Chain Development Business Network for Offshore Wind	
BOEM-2022-0071-0207	Brothers and Sisters, As union families, we strongly believe in solving today's environmental challenges in ways that both create and maintain quality jobs to build a stronger, fairer economy. The planned Sunrise Wind offshore wind project will bring jobs, training and economic benefits directly to union families and local communities. But your assistance is needed today to help the process advance through permitting process. After years of careful planning, community outreach, and extensive studies, the Draft Environmental Impact Statement for the Sunrise Wind project has been released for public comment. This is major milestone in the overall permitting process. Now,	Thank you for your comment.

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	people across the U.S. can submit comments on the DEIS, calling on the Bureau of Ocean Energy Management (BOEM) to keep offshore wind projects on track, without delay. But we need to amplify labor's voice and let BOEM know how important the project is in delivering union jobs. We encourage all members to make their voices heard, as offshore wind has the potential to stimulate local economies throughout New York – and more regulatory hurdles from BOEM would put delivering those union jobs at risk! BOEM is now accepting comments from the public until February 14, 2023 and we need your help to speak out! We'd ask that you take a minute of your time today to easily submit comments online in support of the project – encouraging BOEM to move the permitting process forward and unlocking the economic and jobs potential of the U.S. offshore wind industry. ONLINE WRITTEN COMMENTS First, copy one of these four messages: (right click on a computer or hold your finger down on a smartphone) As a member of the NYS Carpenters Union, I write in support of Sunrise Wind. Offshore wind projects are critical to solving today's environmental challenges in ways that both create and maintain quality jobs to build a stronger, fairer economy. Sunrise Wind alone is investing hundreds of millions of dollars in New York that will create hundreds of union jobs around the state. And once complete, the project will power more than 600,000 homes annually with clean energy.	

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	Orsted and Eversource, the project developers, have signed a Project Labor Agreement with the North American Building Trades and Local Building Trades Councils to ensure their projects will be built with local union labor. This important agreement gives us confidence that Sunrise Wind will be constructed under fair and equitable terms for members of our union family.	
BOEM-2022-0071-0209	As Executive Director of Renewable Energy Long Island (a 501-c-3 organization) and resident of Long Island, I support responsibly developed offshore wind projects in general, and, in this case, the Sunrise Wind project. This project will help New York transition from fossil fuels to renewable energy and create hundreds of jobs throughout its design, construction and operating lifetime. It will be located over 30 miles offshore, interconnect to the Long Island electric grid in Brookhaven township, and inject electricity generated from an abundant and renewable energy source directly to 600,000 homes in the region. Unfortunately, we now have just a small window of time left to address the global climate crisis. We need to deploy climate solutions which are commensurate in scale to the magnitude of the problem, and we need to bring these solutions to bear within a decade or so. Building offshore wind farms and building the industry that supports such infrastructure is one solution which will help us to reach the required scale and speed of deployment. I thank BOEM for its diligent work on offshore wind power and specifically on this Sunrise Wind project, and urge you to move forward as expeditiously as possible to ensure that our region, the State of New York, and the country will be able to harness our offshore wind resource and the environmental and economic benefits that come with it.	Thank you for your comment.
BOEM-2022-0071-0213	To whom this may concern. I am in support of the wind energy projects off shore. Being in New York we should always be ahead in providing energy solutions today for tomorrows problems. I have been to other states that have them on land and they are not an eyesore so to have them so far off shore where they will never be seen should not even be a discussion. If I could I would put one on my own property. Renewable energy can only be a good thing. Thank you and God bless America!	Thank you for your comment.

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BOEM-2022-0071-0214	I support the Sunrise Wind Project. This will help the environment with clean energy production. Please approve this project. Thank you.	Thank you for your comment.
BOEM-2022-0071-0215	As A Proud Union Member, Born On Long Island, I Am Exited And Eager To Make Great Strides In Going Green, And Making Cleaner Reusable Energy. This Will Only Be A Win Win For The Environment, Working Families, And The Outlook Of The Future Of Our World. I Encourage BOEM To Help In This Incredible Endeavor, To Make Our World A Better Place For All Humankind. God Bless!!	Thank you for your comment.
BOEM-2022-0071-0216	I believe it is important to explore all aspects of clean, renewable energy resources, including the costs to mine the energy. Aesthetics/ locations/documented impact on wildlife (positive and negative) are significant as well, and I believe should be part of the broad picture when considering any energy resource.	Thank you for your comment.
BOEM-2022-0071-0218	We need more wire like this to get us off fossil fuels.	Thank you for your comment.
BOEM-2022-0071-0223	As a member of the Long Island Federation of Labor, I am writing to encourage this project to go through. We need clean energy on Long Island. We have lagged behind in progress for many years. This project will bring much needed jobs and technology to the union workers of Long Island. In order to grow and keep pace with an economy, we must have the jobs to do so. Marie Boyle, RN, BSN NYSNA BOARD OF DIRECTORS EXECUTIVE COUNCIL LONG ISLAND FEDERATION OF LABOR	Thank you for your comment.
BOEM-2022-0071-0227	SLR Consulting US LLC (SLR) is pleased to submit the following comments on the Draft Environmental Impact Statement (DEIS) for the Sunrise Wind Project (SWP) Construction and Operations Plan (COP). SLR is an international environmental and advisory services consultancy with over 430 employees in 34 offices throughout the US, including many in the Northeastern US where the subject project will be located. Throughout our almost 30-year history, SLR has conducted numerous expert environmental studies and analyses for both the renewable power and fossil fuel power industries in the US and globally. These documents have supported the lead environmental review agencies in conducting the necessary careful review of the environmental impacts of these onshore and offshore energy projects. Some of the	Thank you for your comment.

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	energy projects we have supported have been under review of the Bureau of Ocean Energy Management. This offshore wind project jointly developed by Ørsted and Eversource will be the first to connect in New York and is a critical component of the State's plan to meet its 100% renewable energy goals. New York State has established one of the more aggressive renewable power generation goals in the US, and a significant portion of this goal is planned to be met with thoughtfully designed offshore wind projects such as the SWP. Also, the US recently rejoined the Paris Climate Accord, signaling a renewed focus by the current Administration on reducing our economy's carbon footprint. The Power Sector will undoubtedly play an important part in that effort. As we witnessed in Europe in SLR's beginnings there, the development of a domestic support network skilled in offshore wind development will accelerate as projects such as SWP are approved. We see the SWP as an important early step in this regard. The thoughtful design, construction and operation of offshore wind power facilities can ensure that environmental impacts be minimized. BOEM's DEIS is providing a thorough review of the environmental impacts of the construction and operation plan for the project. This review will ensure that the public's interest in environmental protection is served while also allowing renewable power to thrive and grow and help the US achieve its carbon reduction goals in a cost-effective manner. SLR Consulting US LLC slrconsulting.com We appreciate the opportunity to provide these comments on the SWP COP DEIS. Sincerely, SLR Consulting US LLC	
BOEM-2022-0071-0233	As a member of local 25 I am in support of Sunrise Wind solar project. William w Czaikowski	Thank you for your comment.
BOEM-2022-0071-0235	I support all green energy projects.	Thank you for your comment.
BOEM-2022-0071-0238	The many Long Islanders who strive to live a healthy life while lessening our impact on our ecosystem strongly support the Sunrise Wind project. It is beneficial in every way. On a local level, it is impossible to overstate the positive impact of removing the fossil fuel emissions necessary to power 600,000 homes. We all breathe the same air, and	Thank you for your comment.

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	the fact that fossil fuel emissions kill millions around the globe and up to hundreds of thousands in the US every year needs to be factored into every decision regarding energy production. The quality of our air not only kills, but it sickens countless people of all ages—from the developing fetus to seniors to the immune compromised and everybody in between. On a global level, it is essential that we remove fossil fuel emissions from our atmosphere as soon as possible. The impacts of not addressing the destabilization of our climate will affect Long Islanders and every other part of our country and world. New York's leadership on clean energy helps to set the tone for the world to follow, and requires anything but sacrifice from us. For our efforts, we will reap the benefit of hundreds of well-paid jobs, cleaner air, and a stable climate. For our region, for our world, for our children and future generations, we urge the BOEM to approve the permit application for Sunrise Wind.	
BOEM-2022-0071-0239	As a lifelong resident of Long Island I am in favor of Sunrise Wind offshore wind farm project. Sunrise plans to invest hundreds of millions of dollars to create clean renewable energy sufficient to power 600,000 homes on Long Island. The first home my wife and I purchased was in Island Park not far from an old LIPA power plant. This plant was rarely used at that time (mid to late 1990's). When it was powered up it created a dark cloud of exhaust which was disturbing to see. Several people on our block were diagnosed with rare cancers. The family two doors down lost a young son to cancer. I don't know if there was a causal link between these things but it was a factor in our decision to sell that home and move to a different area when our son was a toddler and we were expecting our daughter. I hope the clean energy produced by this wind farm will reduce the need to use obsolete and deteriorating power plants in Island Park, Northport, Port Jefferson and	Thank you for your comment.

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	other towns on Long Island during times of peak demand and will reduce the stress on our electric grid. Thank you for this opportunity to provide my opinion. Sincerely, William Adams Smithtown, NY	
BOEM-2022-0071-0247	Dear Program Manager: I am pleased to write this letter in support of the Sunrise Wind project. As the world's leading Geo-data specialist, Fugro provides integrated data acquisition, analysis and advice to help our clients mitigate risk during the design, construction, and operation of their assets. In the renewable energy market, our solutions have been used in over 50% of offshore wind farm projects globally. The expansion of offshore wind in the US is a key part of global transition to a sustainable energy future. We are proud to be part of this process, and have executed more than 25 offshore wind projects to date. For Sunrise Wind, our involvement has included site characterization services to inform cable corridor selection and turbine foundation design, among other critical development activities. It is a project that we believe should move forward as scheduled to become one of the first full-scale offshore wind developments in the country. Thank you for this opportunity to provide support for the Sunrise Wind project. Sincerely, Andrew Cooper Director Offshore Wind, Americas Branch Manager, Virginia	Thank you for your comment.
BOEM-2022-0071-0252	I believe very strongly in renewable energy. This project's long-term benefits go beyond our community and extend to the planet's well-being. The vision of our children's future is far more important than a few people's view from their houses. Please think big picture here!	Thank you for your comment.
BOEM-2022-0071-0258	Dear Members – As union families, we strongly believe in solving today's environmental challenges in ways that both create and maintain quality jobs to build a stronger, fairer economy. The planned Sunrise Wind offshore wind project will bring	Thank you for your comment.

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	jobs, training and economic benefits directly to union families and local communities. But your assistance is needed today to help the process advance through permitting process. After years of careful planning, community outreach, and extensive studies, the Draft Environmental Impact Statement for the Sunrise Wind project has been released for public comment. This is major milestone in the overall permitting process. Now, people across the U.S. can submit comments on the DEIS, calling on the Bureau of Ocean Energy Management (BOEM) to keep offshore wind projects on track, without delay. But we need to amplify labor's voice and let BOEM know how important the project is in delivering union jobs. We encourage all members to make their voices heard, as offshore wind has the potential to stimulate local economies throughout New York – and more regulatory hurdles from BOEM would put delivering those union jobs at risk! BOEM is now accepting comments from the public until February 14, 2023 and we need your help to speak out! We'd ask that you take a minute of your time today to easily submit comments online in support of the project – encouraging BOEM to move the permitting process forward and unlocking the economic and jobs potential of the U.S. offshore wind industry. ONLINE WRITTEN COMMENTS The easiest way to share your support of this critical project is to submit comments ONLINE. First, click here to go directly to the Notice's webpage: https://www.regulations.gov/document/BOEM-2022-0071-0001 Then, follow these easy steps to submit your comment: · Click the "Comment" button on the top left · Once on the Comments page, enter the required personal information and your comment: · Either type or paste your comment in the appropriate field. · OR, you can attach/drop a file (Word doc, pdf, etc.) into the appropriate field to upload your comment (on organizational letterhead, for example). · As a member of IBEW Local Union 25 ,I write in support of Sunrise Wind. Offshore wind projects are critical to solving today's environmental challenges in ways that both create and maintain quality jobs to build a stronger, fairer economy. · Sunrise Wind alone is investing hundreds of millions of dollars in New York that will create hundreds of union jobs around the state. And once complete, the project will	

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	power more than 600,000 homes annually with clean energy. · Orsted and Eversource, the project developers, have signed a Project Labor Agreement with the North American Building Trades and Local Building Trades Councils to ensure their projects will be built with local union labor. This important agreement gives us confidence that Sunrise Wind will be constructed under fair and equitable terms for members of our union family. · I urge BOEM to support the approval of Sunrise Wind so that we may get to work, and many more residents can begin to realize the multi-faceted benefits of this important project.	
BOEM-2022-0071-0265	We need more wind farms! Offshore wind is a spectacular way to do it! I am a sailer and I LOVE seeing windmills in the water! Off shore wind Off shore wind!!!	Thank you for your comment.
BOEM-2022-0071-0266	I am all for this project as long as PSE&G uses any energy saving to either lower the cost of electric power to consumers, or uses the additional profit to upgrade the power infrastructure on Long Island - i.e. make underground power lines the standard and upgrade the entire island to this standard over the next 15 years. This will reduce our vulnerability in future severe weather events. They are asking the citizens to give up partial view of the ocean and clear access to it from the bay, so this can't just be for more profit on the part of the utility. This move needs to be reciprocal.	Thank you for your comment.
BOEM-2022-0071-0267	The principle of increasing sources of clean energy is absolutely necessary. However, information regarding potential adverse impacts affecting navigation and fishing should be fully vetted.	Thank you for your comment.
BOEM-2022-0071-0277	This is a great opportunity for folks in the trade union to partake in the green energy movement. We need opportunities to pivot our craft from industries that are being phased out. This would be an amazing opportunity to do just that and have it done safely with skilled union labor.	Thank you for your comment.
BOEM-2022-0071-0278	I want to keep this brief and short, there should be no reason why this project hasn't already hit the ground running. There are endless opportunities and environmental	Thank you for your comment.

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	advancements that this project will bring, not to mention its clean energy which is what our world needs right now. Also the family's of not only the workers but the residents locally will be benefited hugely from this whether it be work opportunities or a better way of life.	
BOEM-2022-0071-0279	I think this is a step in the right direction as we need to continue to explore and expand our energy options particularly in the renewable energy sector.	Thank you for your comment.
BOEM-2022-0071-0282-0001	"My name is Tom Barracca. I'm currently employed with Stony Brook University and I" m the associate Director of Growth in the Office of Economic Development. I want to call and express my support of the Sunrise Wind Project as proposed by Ørsted and Eversource. Stony Brook University, for those who are not familiar with it, is a flagship research institute for the State of New York school system -- university system. In addition, I'm a longtime energy professional with over 29 years at local energy companies and utilities in New York State. In such role, I've served as project manager for renewable energy programs for the Long Island Power Authority, and as a manager of electric system reliability. More recently, I've worked in technology companies and offshore wind in the United States and Europe. I believe Sunrise Wind Project brings significant economic and environmental benefits to Long Island, New York, and the US economy. This project will be the second project in New York and will help achieve the State" s aggressive energy mandate of nine gigawatts of offshore wind by 2035. Primarily, the economic benefits we're going to see is a creation of over 800 direct jobs and over 1200 indirect jobs in New York. Primarily, from the university standpoint, this project" s very important. Ørsted and Eversource have worked with the State university system in NYSERDA, which I mentioned before to do groundbreaking studies in both electrical engineering and environmental marine scientists to support some of the work in the DEIS. Also, very important to us is the $10 million used for the National Offshore Wind Training Center, which is located in Suffolk County to promote good- paying union jobs	Thank you for your comment.

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	as well as professional workforce development to support this huge growing industry in the US. From an environmental perspective, Ørsted has to be commended to start its analysis many, many years ago leveraging the groundbreaking work that was done by NYSERDA, to evaluate the optimal offshore site locations through Sunrise Wind" s Construction Operation Plan that BOEM submitted in 2020. I know firsthand that Ørsted and Eversource have been very, very visible in the community working with stakeholders to collect additional data since that time to support the plan that's in front of BOEM right now, to minimize the environmental impacts of the project, and make the most cost- effective, clean energy project they can. In this process also, the Sunrise Wind Team has been very transparent. They've had a number of stakeholder and community meetings here on Long Island and in the region, and they've listened to those stakeholders and the plan that's here today is a result of that. In addition, they've worked with Stony Brook University's leading program in atmospheric marine sciences, and they were looking for independent study of some of the challenges they're faced in doing this project, and I know firsthand that they've gotten some great results looking at the effects of the project on fish migration and trying to minimize those factors. From a utility perspective, clean energy is not just something mandated by the federal government located on the main East/ west corridor of transmission lines of the Long Island Power Authorities electric system, that serves over 1 million electric customers, population of 3 million customers, and only a thousand square miles. The LIPA System currently receives its electric generation from three major -- major fossil power plants, and many, many other small fossil fuel generators, as well as import cables from New York City, New Jersey, and New England. So, the bottom line is there – you're replacing a significant chunk of that fossil generation with clean energy in the load center where it's needed and from New York State, but it's something that's really needed in the Downstate New York area. As everyone probably knows, it's the most load- intensive area of the United States, and	

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	bringing clean power into this area is critical, and offshore wind's the best way to do it. Sunrise Wind is ideally located from a grid perspective, to bring over one megawatt of power into the Holbrook substation, which is located on the main East/ west corridor of transmission lines of the Long Island Power Authorities electric system, that serves over 1 million electric customers, population of 3 million customers, and only a thousand square miles. The LIPA System currently receives its electric generation from three major -- major fossil power plants, and many, many other small fossil fuel generators, as well as import cables from New York City, New Jersey, and New England. So, the bottom line is there -- you" re replacing a significant chunk of that fossil generation with clean energy in the load center where it" s needed.	
BOEM-2022-0071-0282-0002	Hi, my name is Laura Fabrizio, L- A- U- R- A, Fabrizio, F- A- B- R- I- Z- I- O, and I am the co- founder of the Moriches Bay Project. For those who don" t know, the Moriches Bay Project is a not- for- profit dedicated to improving water quality. We do that primarily through oyster farming and most of our placement is done in the Moriches Bay area. I want to convey my support for Sunrise Wind. I commend Ørsted for their dedication to creating a world that runs entirely on renewable energy, a concept that is past due, but it" s never too late to get started. The DEIS is a testament to the thorough and necessary analysis of environmental impact and is clear proof that the clear energy created from this wind forum is a great step in the right direction of protecting our environment.	Thank you for your comment.
BOEM-2022-0071-0282-0003	Hi, good evening. My name is Camden Ackerman, C- A- M- D- E- N, Ackerman, A- C- K- E- R- M- A- N. I'm actually here tonight just as a resident of Long Island who isvery excited about this project. I really, really want to commend Governor Hochul in the State of New York for making this an initiative. And I can't echo enough the gentleman from Stony Brook for everything he said. I won't take five minutes to explain everything there because I	Thank you for your comment.

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	think he did a wonderful job. But offshore energy has been a proven and successful route for energy throughout the world and as a resident of Long Island, I am hoping that New York State, the federal government, and all of Long Island will embrace this vital resource which is going to bring net positives across our region. And to one other point that I've heard many times from local residents who are concerned about fishing in the area, I do want to credit BOEM for their presentation earlier in the evening, for pointing out the fact that these wind turbines create artificial reefs which not even theoretically it's been proven will expand our fish population in the ocean. And I'm very excited for all of this, and I want to thank everybody and thank you for BOEM for holding these hearings.	
BOEM-2022-0071-0282-0004	Good evening. My name is Helen Torkos. I'm hoping you can hear me. Great. It" s Helen, H- E- L- E- N, Torkos, T- O- R- K- O- S. I" m a director of board of directors for the Shirley and Mastic Chamber. And we are excited about this project, and we've been hearing about it for so long. It's finally time that we got a little bit more detail and this venue here, this webinar is very important to us. So, we will be sharing this information with our board members and the rest of our membership in the board. Being that we are in the Mastic Shirley area, we know that the -- we don" t want any impact as far as the residents, the commercial anything like that. And I think BOEM is doing a great job with making sure that there isn't a severe impact on residents. So, we appreciate that. And that's all the comment that I needed to make.	Thank you for your comment.
BOEM-2022-0071-0282-0005	Great, thank you so much. My name is George Povall, G- E- O- R- G- E, P- O- V- A- L- L, and I'm the executive director of All Our Energy. We're a Long Island nonprofit focused on environmental protection and education to empower public supportive renewable energy development and inspire action to protect that environment. And we've been actually pushing for environmentally responsible development of Offshore Wind since 2014 when we -- at our inception and we" re very excited to see this moving forward now. So, this past Friday, CBS News reported that climate change warming effects on the	Thank you for your comment.

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	ocean in 2022 are equal to five Hiroshima- type atomic bombs being detonated every second, every day for the whole year in our oceans. This amount is equivalent of over 100 times of all of the electricity generated in 2021.We must understand climate change is the number one threat to a clean and healthy ocean and all of its creatures. Delayed action is a failure for humanity. And just because what is happening is not visible to the naked eye, does not mean our ocean is not already industrialized from that climate pollution. In addition, we should discuss what we are doing about all of the continuous current vessel strikes on whales, turtles, and other marine mammals that have happened these last few years tragically, and all before Offshore Wind even began. We need to make sure that these whales are protected, but to pretend that we need to protect them only from offshore wind in some imagined potential scenario and not actually address the current numerous continuous vessel strikes is really a high level of environmental malpractice. We recently have two dead whales during a time of near-zero offshore wind activity in the last few weeks, how organizations can undermine their own credibility, basically connecting these to offshore wind with no science proof or reality is really just sad. So, we look forward to continued stringent monitoring and holding developers, the federal government and the state government to the highest possible standards to require offshore wind construction operations and maintenance, including oversight. And that should include all other traffic in the area, including with penalties for others, breaking the rules in offshore wind area during those operations. All Our Energy support Sunrise Wind as part of the desperately needed large- scale buildout of Offshore Wind, we know is necessary to alleviate the climate impacts that cannot begin soon enough to displace the dirty fossil fuels that are at the heart of our climate crisis. And there at the heart right now, every day in all of our industrial lives without exception, we look forward to this transition.	

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BOEM-2022-0071-0282-0006	Thank you, Marcy. It" s Maura Spery, M- A- U- R- A, last name is S- P- E- R- Y. I am the president of the Mastic Beach Conservancy, here in Mastic Beach. Our mission at the Mastic Beach Conservancy is we're committed to conserving and creating a blue-green trail on the six and a half miles of publicly accessible waterfront that is mostly wetlands. We are a very underserved, low to moderate- income community that is at sea level, basically, and has really suffered and is suffering from the negative impact of sea level rise. We support Sunrise Wind, Ørsted, and Eversource in their efforts here to combat climate change, which is really happening at quite an alarming rate as everybody's been talking about. We look forward to working with Sunrise to help our community not only work on mitigating some of the negative effects of the climate change and sea level rise, but also in helping to educate the community and others as to what's going on, how it's going on. A big part of our initiatives, our educational we're collaborating with Cornell Seatuck Environmental. We hope to be working with Stony Brook. We're working with all the different governments. So, we just support this effort and we really look forward to working as a community to make improvements and, and help us as an underserved community here in Mastic Beach with Ørsted Eversource and Sunrise. And just wanted to thank you for the time to speak and to let you know of our support. Oh, and just to mention that the Smith Point Bridge meeting is also tonight, so, some people might be running to go to that as well. All right, thank you so much.	Thank you for your comment.
BOEM-2022-0071-0282-0007	My name" s Adrienne Esposito. It" s A- D- R- I- E- N- N- E, E- S- P- O- S- I- T- O, Executive Director, Citizens Campaign for the Environment. CCE is a 120,000 - member organization throughout New York State whose mission is to protect our environment,	Thank you for your comment.

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	our natural resources, public health, and fight climate change. I'm also testifying tonight to offer strong support for the Ørsted Project as Sunrise Wind. Not only am I the executive director of CCE, but I" m also a Brookhaven Town resident who lives on the South Shore. And as a South Shore resident, we understand and live every day what it" s like to be at ground zero for climate change. This is not something we read about, you know, in the newspaper or see on the news, this is something we see out our front doors. And so, it" s not just hurricanes and big storms, it's even now simple rain events and norwesters that are doing damage to our homes, our properties, our infrastructure, and costing unbelievably amounts of money. So, climate change must be addressed. It is not a luxury item to address it, it" s a necessity. As far as the Draft DEIS is concerned, there are many things that we thought were very comprehensive about it. We want to thank BOEM for including this section that evaluated the benefits of actually addressing climate change. So, one of the things we had asked for, and you included, was that if we did nothing and climate change continues, what kind of economic and environmental impacts would that have? So, we're glad to see a section in the Draft DEIS talking about the benefits of addressing climate change. One thing I did not see in there that I already requested, and we're going to put more extensive comments in writing, but as we connect offshore wind, such as Sunrise Wind to the Suffolk County grid, we will be able to taper down existing fossil fuel power plants. In this case, it'll most likely be Northport or end Port Jefferson Power Plant. That not only brings us reduced air emissions but what the Draft DEIS did not talk about is how that would improve the marine environment. Both the Northport power plant and the Port Jefferson Power Plant use open- loop cooling systems, which means that they are taking out larval in both finfish and shellfish from the Long Island Sound Estuary System, and from the harbors where that intake valve is located. Also, it's not just larval, it's also juvenile fish and sometimes horseshoe crabs. So, I think there should be some section in the Draft DEIS that talks about reduced intake by either	

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	Northport or Port Jeff as more wind comes online and how that benefits the marine ecology in either the Port Jeff Harbor or Northport Harbor, and the Long Island Sound Estuary, which is an estuary of national significance. The other thing I want to mention is, just to piggyback on something Tom said, which is downstate is the load area where we need to get more renewables online. And really offshore wind is the only large- scale answer to supplant -- supplanting and replacing these fossil fuel power plants. We can only do that with Offshore Wind. Yes, we can use some solar. Yes, we can use some battery storage, but they will not be able to generate the amount of megawatts we need to close down the three antiquated power plants, that now supply significant part of Long Island" s power grid that makes Sunrise Wind even more important. Last thing I just want to mention is that Ørsted should be commended on their outreach to local businesses, stakeholders" marine scientists, academia, environmental groups. They really have considered themselves partners and they listen and that is a lesson to be learned, I think, and that" s how we want this to be done so that the plan is modified and adjusted based on the stakeholder" s important knowledge of the area. And by the way, as a user and a lover of Smith" s Point Beach, I live just 15 minutes from there. That is an ideal location for the cable connection to come online. The parking lot has never been filled. It" s well -- it is the ample room there for the cable and I think it’s a really ideal selection location. So, thank you very much and we appreciate the opportunity to speak.	
BOEM-2022-0071-0282-0009	Yeah. Good evening. My name is Gary Yerman, G- A- R- Y, Y- E- R- M- A- N. And I" d like to thank BOEM for the opportunity to speak here tonight.	Thank you for your comment.

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	To whom it may concern, my name is Gary Yerman, and I've been a commercial fisherman for 50 years. My son and I are the owners of New London Seafood Distributors, a New London- based unloading facility, and we have owned the business since 1989. It is home base for a dozen commercial fishing vessels, both large and small, operating inshore in sand and offshore to more than a hundred miles. We are vital to their operations, providing fuel, ice, syringe, and shipping of their annual 6 to 8 million pounds of seafood to various markets. I write on behalf of New London Seafood Distributors and as a co- founder of Sea Services North America, a multi- state consortium of active -- excuse me, of active fishermen seeking to help build US Offshore Wind farms. I write in full support of Ørsted and Eversource" s Sunrise Wind project. While Offshore Wind" s development presents uncertainty to many fishermen, it is just that, uncertainty. There is no doubt that uncertainty can be frightening. And while the concerns raised by others was important, we have to be willing to deal with facts rather than fear- based narratives. We have done a great deal of investigation and research and found that each of the concerns raised have been raised in wind projects around the world with virtually no correlation between early concerns and actual commercial impact where fishing grounds remained open. Moreover, here in the United States, we are calling on the global data and industry best practices to find solutions that will address the need for green energy. The fishing concerns and fears of what is being labeled as unknown. As commercial fishermen, local businessmen, and concerned citizens, we are first concerned about our community and profitability. Other fishermen decided to pursue dollars in the form of disruption payments, but we have found another way. We have decided to pursue a sustainable and scalable way to participate in the development to be constructively at the table. So, once we achieved a level of comfort with the Ørsted team, we began to look for ways for our vessels, along with others to work the waters with the Offshore Wind Industry. We have spent time and energy with the Ørsted's	

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	Sunrise Wind team, and we can say they are -- they are the very best in the Offshore Wind Industry. Their investment in the project means a great deal for several New England fishing communities, and we are already seeing economic impact in New London. We want to see Sunrise Wind move forward rapidly. We have worked for nearly four years with the Ørsted's Northeast team, and they have been straightforward, accessible, and as open as we can think they can be. We understand the concerns of some of our fishing colleagues, but given the level of commitment to investment education, job creation, and reduction of fossil fuels, we have seen benefits and know that coexistence is a good thing for the greater good. Two years ago, two associates and I took a trip to Kilkeel Northern Ireland to meet with a group of fishermen organized into an efficient cooperative that provides scout and safety vessels when they are not fishing. We learn firsthand how the wind farms have impacted them and how they in their community profited from them. We shared our concerns and discussed how they have worked together for a positive outcome. The results we saw were more than encouraging, and we decided to put in the time and effort to duplicate this model. That model has become Sea Services North America. We recognize Ørsted's commitment to fishermen as being the first to offer a substantial commercial contract that includes local fishermen to provide scout and safety vessels on Sunrise Wind Project. We completed thousands of miles of scouting with our vessels, Sea Service vessels with no issues, and with that success, it is providing further opportunities to commercial fishermen as guard vessels. That effort was rewarded with contracts that will supplement fishermen" s revenue that is kept by regulations and quotas. That new revenue source comes at a cost: Learning the technology, upgrading health, safety, and environmental standards, and actually doing the work is required.	

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	The opportunities are very real with Ørsted's commitment. This is a not -- this is not a zero- sum game. It is a win- win. We strongly urge that you move the Sunrise Wind project forward with all appropriate speed. Thank you for the opportunity to speak here tonight.	
BOEM-2022-0071-0282-0012	All right. Thank you. S- C- O- T- T, Y- E- R- M- A- N. I've been fishing for 40 years, starting with my father when I was eight years old. While I don" t particularly enjoy speaking at public hearings, I'm actually glad to be here tonight, in support of Ørsted Wind -- Sunrise Wind Project. There are three things I would like to share. The concerns that remain out there are real about Offshore Wind. I shared them, but after really digging into offshore wind with my father and other fishermen who are now part and vessel partners in the Sea Services Group, I came away much more convinced than I thought possible. Particularly with the wind firms remaining open for fishing and turbines space a mile apart. My biggest concerns were resolved. If more people did the same work, I'm pretty sure they would come to the same conclusion we have with offshore wind and commercial fishing industries will be fine side by side for years to come. Ørsted's team had been straight with us from the beginning a few years back. We were toughing them as fishermen. They do what they say, and I can't ask for more than that. Ørsted Wind is providing guys like me a new way to earn money and has already been good for me and for my family. I'm looking forward to working with Sunrise Wind this next year. Thank you.	Thank you for your comment.
BOEM-2022-0071-0282-0014	A- D- R- I- E- N- N- E, E- S- P- O- S- I- T- O, Executive Director of Citizens Campaign for the Environment. And a couple of points of clarity is all real quick. One is that I heard some folks saying that, you know, this is being rushed and it" s such a quick timeline, but actually offshore wind has been discussed and debated and researched and looked at for 18	Thank you for your comment.

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	years here in New York State. So, for us, it doesn't feel rushed, that it doesn't feel like a short turnaround, it feels like a long time in coming. So, we think the timeline" s just fine. The second thing is those that said, let's wait, you know, let's just wait and do something later. They clearly are not living on the South shore of Long Island where we feel the impact, as I said, of climate change on a routine basis. Waiting for us means worrying every day and paying for the continuing impacts associated with sea level rise. The third thing is we have to stop with these myths of whales. The whale mortalities have been increasing since the year 2017. When way before any exploration and assessments were being done for Offshore Wind firms, the three major causes of whale deaths are number one, ship strikes. Number two is entanglement due to commercial fishing equipment and lines left in the ocean. And the third unfortunately now is plastic pollution, which are filling up the whale's bodies. So, there's been necropsy reports, pathology reports, and there are things we need to do to protect whales and it's an urgent matter. But pointing researchers in the wrong direction hurts whales, doesn't help whales. And the last thing I just want to say is, you know, for those who say, well, wind isn't perfect, you" re right, you are a hundred percent correct. All large- scale energy infrastructure has some impact on our environment, but it is our obligation to choose the energy infrastructure with the least impact on the environment and to mitigate any impact it may have. And that's the process I think we're working to engage in altogether. Surely, we want to save whales and we also need to save the planet. We need to do both, and we can do both, but we shouldn't pit each both of those goals against each other. They should be partnership goals and goals we can do together collaboratively. So, without pointing fingers and saying disparaging things about environmental groups, I think there's a partnership to be heard there that we can accomplish saving	

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	nature, saving whales, and saving the planet and not compete for those goals, but rather enhance those goals. Thank you to BOEM for a great meeting and I appreciate the opportunity to make those final comments.	
BOEM-2022-0071-0283-0002	Yes. Hello, my name is Casey Petrashek. Spelled C- A- S- E- Y. Last name P- E- T- R- A- S- H- E- K. And I am here today representing the New York League of Conservation Voters, or NYLCV for short. NYLCV is a New York statewide advocacy organization committed to renewable energy and a clean energy future. Offshore wind is a top priority for us. Thank you for providing this opportunity to comment today. Offshore wind is critical to meet New York" s and the country" s renewable energy goals, reduce our reliance and fossil fuels, and rebuild around green -- green energy economy, which will provide family- supporting jobs and improve public health. New York has committed to 70 percent renewable energy by 2030 and 100 percent clean energy by 2040, including 9,000 megawatts of offshore wind by 2035 . We won" t meet our goals if we only talk about clean energy. It must be turned into reality with real projects on the ground. Sunrise Wind is key to meeting these goals. Sunrise Wind brings significant environmental and economic benefits. This project will generate enough clean energy to power approximately 600,000 homes and will eliminate the generation of more than 50 million tons of CO 2 over the project" s lifetime by displacing polluting fossil fuel power. Beyond the environmental benefits, Sunrise Wind will promote clean, reliable, and safe development of domestic energy sources and clean energy job creation. Hundreds of millions of dollars will be invested and more than 800 jobs will be created, including family- sustaining union jobs. The Sunrise Wind team has been nothing short of amazing partners in this process, making every effort to receive and implement community feedback. This shows in the DEIS report where the majority of the impacts identified are moderate or below with many valuable benefits as well. The New York League of Conservation Voters supports this arrangement project. Thank you for the opportunity to comment on this important project today.	Thank you for your comment.
BOEM-2022-0071-	Hi, I" m Beth Wahl. B- E- T- H, W- A- H- L. And I" m the past president of the Chamber	Thank you for your

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0283-0003	of Commerce of Mastic Beach in Shirley, and also the president of the William Floyd Community Summit. Most New Yorkers understand the need to combat climate change and the importance of building a more resilient economy, which is why New York has set the ambitious goal of producing offshore wind and energy by 2030 . We are proud that Suffolk County is leading the way of combating climate change and building a green economy powered by wind. Sunrise Wind will be the largest offshore wind farm in the country and will provide local businesses and manufacturers the chance to enter the evolving US shore on wind pipeline. With New York" s early focus on offshore wind, we are well- positioned to create a clean energy, and the offshore wind supply chain will create thousands of jobs. We have a unique opportunity to build the offshore wind supply chain here in Suffolk County and lead the way for the offshore wind in the United States. I believe in Sunrise Wind, and that offshore wind is critical to New York, our country, and actually the planet. Thank you so much for allowing me to comment.	comment.
BOEM-2022-0071-0283-0004	Hi there. Nicole Di Paolo, N- I- C- O- L- E D- I- P- A- O- L- O, and I represent the Bluegreen Alliance. The Bluegreen Alliance is a national organization that unites labor unions and environmental organizations to solve today" s environmental challenges in ways that create and maintain quality jobs and build a clean, thriving, and equitable economy. In the United States, we face the dual crisis of climate change and increasing economic inequality and for far too long we've allowed the forces driving both crises to create a wedge between the need for economic security and a livable environment. We know that this is a false choice, we can, and we must address both crises simultaneously and offshore wind energy presents an unequivocal opportunity to do so. That is why the Biden administration has committed to deploying 30 gigawatts of offshore wind by 2030 in unlocking a pathway to 100 gigawatts by 2050. To achieve	Thank you for your comment.

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	these goals, it is essential that projects advance in the permitting process as swiftly as responsible development will allow. For the Blue Green Alliance, responsible development means that projects are developed in an equitable and environmentally responsible manner with high- road labor standards and attention to equity and environmental justice. This includes five key criteria. First, projects maximize the creation of safe, high- quality, and accessible union jobs over the project" s lifetime. This includes commitments to union neutrality for manufacturing, operations, and maintenance jobs, and utilizing project labor agreements for construction. Second, projects expand domestic manufacturing along robust domestic, regional, and local supply chains by maximizing the use of US- made content. Third, projects deliver community benefits with attention to environmental justice and improving access to disadvantaged communities. Fourth, projects utilize the best available science, data technology, and adaptive management strategies to avoid, minimize, mitigate, and monitor impacts to fisheries, wildlife, and marine ecosystems. And fifth, projects are guided by robust and inclusive stakeholder engagement. This includes labor organizations, tribal nations, historically underrepresented or disadvantaged communities, low- wealth communities, communities of color, and impacted ocean users. These imperatives are consistent with federal statutes and the commitments that the that President Biden has made to deploy offshore wind energy in ways that strengthened domestic manufacturing, increased resiliencies to the impact of climate change, conserve biodiversity, deliver environmental justice, and spur well- paying union jobs, and economic benefits. The Sunrise Wind Project will make a significant contribution towards our national goals, as well as New York" s goal to deploy nine -- nine gigawatts of offshore wind by 2035 and we urge BOEM to advance it in the permitting process. Thank you so much for the opportunity to comment and for your work to ensure that offshore wind projects are done right for workers, communities, and the environment.	

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	Thank you.	
BOEM-2022-0071-0283-0005	Great, thank you. Yes, my name is Katie Cubina, K- A- T- I- E, last name is C- U- B- I- N- A, and I represent Mystic Aquarium, located in Mystic, Connecticut. Thank you for giving me the opportunity to testify on behalf of my organization. Here at Mystic Aquarium, our mission is to inspire people to care for and protect our ocean planet through conservation, education, and research, and it is those three areas that I oversee. When our guests come on campus, they see incredible exhibits in animals, but they also see the threats that our oceans face today. And one of the greatest threats that our oceans face is -- is that of global warming and climate change in all of the related issues that come with that. It is with that in mind that we are committed to putting our full support behind the Sunrise Wind Project and Ørsted Eversource in their efforts as it relates to the sustainable and responsible development of offshore wind. We are also committed through our research, education, and outreach program to be an active agent in -- in the responsible development of offshore wind through our research program, which focuses on marine biodiversity and aquatic animal health. As it relates to our guests and our young people, we have an exhibit on renewable ocean energy and within a gallery entitled, " Ocean Solutions." So, we can look to the ocean and with smart decision- making, responsibly develop aspects of the ocean to solve some of our most pressing environmental crises and climate is certainly at the top of the list. We also are committed to making sure that young people are prepared for all of the available jobs that will result from the emerging offshore wind industry on the Eastern seaboard. And so, with that in mind, we also work with Youth Serving Organizations in the region and through an exhibit on our campus because we know that the equitable employment and frontline communities who have borne the brunt of climate change	Thank you for your comment.

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	need to be adhered to the -- the best practices and principles for gaining access to the jobs that will be available. Our experience working with Ørsted Eversource has been really positive as a partner in this region, which we are in southeastern Connecticut, and we look forward to continuing to work with them to make sure that the goals of mitigating climate change and providing jobs to -- to our region are fulfilled. Thank you.	
BOEM-2022-0071-0283-0006	I am Stacy Sikes, S- T- A- C- Y S- I- K- E- S, and I am the Vice President of Government Affairs and Communications at the Long Island Association, which is our region" s leading business organization. Long Island has close to 3 million people and is larger than 15 states. And our goal at the LIA is to make Long Island the offshore wind capital of the United States. Sunrise Wind is key to that strategy. Ørsted and Eversource have demonstrated a strong and unwavering commitment to Long Island through a series of initiatives and investments. They have spent countless hours meeting and partnering with other Long Island Association members, community organizations, workforce development programs, small businesses including MWBE, and veteran- owned companies and labor unions. Sunrise Wind will result in significant economic and environmental benefits to Long Island. This offshore wind project will be the second to connect in New York and will help the State achieve its energy -- clean energy mandate to build nine gigawatts of offshore wind by 2035. The developers have been working closely with the Town of Brookhaven on its plan interconnection at the Holbrook Substation, and we are excited for this project to become operational by 2025 . Sunrise Wind submitted its construction and operation plan to BOEM in 2020 and has continued to work tirelessly to collect data and to provide all agencies and stakeholders with information on the benefits and environmental impacts of the project. The DEIS that is subject of -- that is the subject of this public comment process	Thank you for your comment.

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	is comprehensive, and the project will have substantial and -- substantial and meaningful long- term clean energy benefits and is transformative in terms of the economic opportunities it offers, including 800 direct jobs, 200 indirect jobs, and a direct investment of more than $400 million in New York State. Sunrise Wind has already committed to the following: $ 10 million for a National Offshore Wind Training Center that will be located in Brentwood in Suffolk County; $ 5 million for a research and development partnership with Stony Brook University, locating an operations and maintenance hub in Suffolk County that will serve the joint ventures team of a portfolio of projects, and Port Jefferson will be the home port of a service operation vessel that will support maintenance operation of the portfolio of projects from the developers in the Northeast. Ørsted and Eversource are actively engaging local businesses to become part of the supply chain through several different Long Island Association events and forums across our region. Sunrise Wind offers tremendous opportunities to Long Island, New York State, and the entire United States as a way to transition to clean energy by meeting New York" s ambitious goal of 70 percent of renewable energy by 2035, creating good paying and union jobs, providing opportunities to businesses operating in traditionally underserved communities, and will further solidify a domestic offshore wind industry. And therefore, we ask that you approve the DEIS and Sunrise Wind Construction and Operations plan. Thank you.	
BOEM-2022-0071-0283-0008	Fantastic. Thank you. My name is Daniel Busi, spelled B as in boy U- S- I, and I work for Renewable Energy Long Island. In addition to being a program manager for Renewable Energy Long Island, I have 10 years of experience working in the field of sustainability along with a Bachelor of Science in environmental science. I" m not an alarmist. I don't consider myself an -- I consider myself an optimist, but there's no doubt in my mind that earth is in desperate need of change when it comes to our energy production. As we're talking about offshore wind, it's worth noting that over the past 30 years,	Thank you for your comment.

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	we've lost 50 percent of earth's coral reefs. We're currently going through a sixth extinction on this planet, a loss of life not seen for over 65 million years. And scientific consensus indicates that the primary cause of this is climate change brought on by global warming. The primary problem has been identified and so have solutions. Wind power is undeniably one of these solutions. Wind power, specifically offshore wind power is one of the most efficient sources of renewable energy production humans have ever created. As we begin to phase out our dwindling supply of conventional fossil fuels, utility energy production systems need to be powered by renewable options. Much of the rest of developed world knows this, and our European counterparts are far ahead. As someone who's traveled extensively throughout the Mediterranean Sea, the North Sea, the Baltic Sea, in 2014, nearly 10 years ago, was amazed at how extensive their offshore wind development was. As the USA begins this development process, I encourage all permitting entities to take note of their success and lessons learned and -- and help to propel the US to achieve similar accomplishments. That's all. Thank you.	
BOEM-2022-0071-0283-0009	Hi. Good afternoon. My name is Michael Daly. M- I- C- H- A- E- L D, as in David, A- L- Y. And thank you. I'd like to thank BOEM and the Army Corps and -- and Ørsted for all of the work that goes into creating this and I -- I represent East End YIMBY, but I" m speaking for myself today. East End YIMBY is an affordable community housing advocacy group on the East End of Long Island and we know what level of work that has to go into anything that's bringing about change in our communities. And we know that the public comment period can be arduous and very, very difficult, so you've done a great job today. Thank you for that. I'm in support of the Sunrise Wind LLC proposed wind farm offshore in New York. Wind farms have proven productive and a safe way to provide electricity and reduce our dependency on fossil fuels, which contributes to global warming. I am an East End resident currently I live in Sag Harbor, and I have been following the South Fork Wind project for a number of years. And I've had the good fortune to be educated	Thank you for your comment.

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	by people from Ørsted, from fishery people, from elected officials and -- and actually watched the -- the work that they" re doing to -- to bring that -- that project into development. So, I have -- while I have friends who are -- are -- are fisher people and farmers and also Native Americans, I -- we are -- we are friends of the Shinnecock Nation, and I'm so glad that you are including them in this conversation because they are the ultimate water defenders on our East End. From watching, I -- I have a great deal of confidence that this is going to be done correctly, and we certainly don't want to see any damage done to the cod industry, that's my favorite fish. But we are confident that through this process and the -- the technology that's been developed over many years, that this development will be constructed safely, securely, and using environmentally sound measures. So, thank you for all your work, and Godspeed on all of this.	
BOEM-2022-0071-0283-0011	Thank you. This is -- my name is Roger Clayman, R- O- G- E- R C- L- A- Y- M- A- N. I" m representing the Long Island Federation of Labor AFL- CIO. We are the fourth largest organization in the AFL- CIO of Central Labor Councils. We represent 250 , 000 union members on Long Island with their families. We've been promoting offshore wind for -- on Long Island for more than 10 years. I want to thank you for your opportunity to provide the reasons for -- from the perspective of organized labor to approve the Construction and Operations Plan, allowing this very much- needed offshore wind project to move forward. Sunrise Wind has worked hard to collect data and to provide all the agencies, stakeholders, and individuals with information on the benefits and potential environmental impacts of the project. From our perspective, that's the strength of the proposal submitted by Ørsted Eversource. They have demonstrated a unique ability to communicate with stakeholders with great clarity and detail over many years of planning in this region. The public can be assured that the substantial economic benefits offshore wind will bring to this region and the nation will be done in an environmentally sensitive manner and a way that is understood by the public.	Thank you for your comment.

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	There's really deep and diverse stakeholder support among local environmental and labor organizations on Long Island. I am really proud to say that Brookhaven Town Board and Suffolk County have executed agreements to authorize the use of publicly owned real estate and rights of way for the preferred route. I'm a -- I live- in Brookhaven at Suffolk County, so I -- I" m pleased that that has taken place. Of course, the jobs created by this project are a major interest to our labor movement. Construction and operation of Sunrise Wind will create more than 800 direct jobs and over 1,200 indirect jobs in New York. Construction of Sunrise Wind will be performed under a project labor agreement. This creates union jobs, which allows our communities to grow and prosper. It provides the opportunity for apprenticeship opportunities and pre- apprenticeship outreach into underserved communities. Long Island will become a center for offshore wind work -- the workforce and will be the center of a major industry that both strengthens our -- our economy and combats climate change at the same time. You've heard listed publicly some of the great benefits and investments, $5 million research and development, partnership with Stony Brook, locating the Operations and Maintenance Hub in East Setauket, and Port Jefferson, the home to the port for service operations vessel, for operations and maintenance. There's also, of course, the supply chain which is very important for our region in Albany. But I" m -- can tell you from firsthand my work with the -- their investment, the $10 million investment in the National Offshore Wind Training Center is going to be vital for everyone. It'll provide Global Wind organization certifications and is made possible by the investments of Ørsted Eversource. The -- we believe that as it's been stated and we've said this many times that -- that Americans should not have to choose between a good job and a clean environment. We can and must have both. And this project it's not only an opportunity not only to	

Comment No.	Comment	Response
	keep the -- our clean energy future on track, but we" ll create the family- sustaining union jobs at the same time. I urge BOEM to move forward with the Sunrise Winds permitting process. Thank you for the opportunity to speak.	
BOEM-2022-0071-0284-0001	Thank you for facilitating. My name is Jok Kommer. Joseph Kommer to those that want my real first name. I'm a homeowner in Riverhead, a retired science teacher from the east end of Long Island, and have spent the better part of my adult life on Eastern Long Island. I have no direct concerns on the organization of this project because it seems that BOEM and the Corps of Engineers and the other organizations are expressing at least due diligence on the science aspect and also obviously in the permitting process. I do think it's very important that given that there is both beneficial and adverse effects to be anticipated before, during, and after, that there is very close attention paid to those things, especially as related to onshore resources that are created for maintenance of the systems, and for delivery of the electricity but as well as the offshore concerns legitimately expressed by the fishing community, especially recreational fishermen. Many of those things have been addressed by spacing and other considerations on the turbines themselves. But it will require a continuous monitoring effort during the entire process of construction because that'll be very heavy shipping. And then also during the maintenance phase, while the turbines are in operation. I also have concern for the fact that as a part of this very great undertaking by the State of New York and also by the federal government in pushing it in other States as well, that these things be communicated effectively to the public. Part of that responsibility I think goes to the organizations that will generate the power and benefit from it financially. And so, they have a responsibility to the -- the constituents that are allowing these things to happen in their waters and crossing the land areas where they will cross. Toward that end, I think it's an important opportunity to educate people on	Thank you for your comment.

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	how things are done safely and what considerations are given to wildlife fisheries of all sorts to the benthic environment as well as to the coastal environments and in addition to the humans that will be affected by this project and by the other ones that will soon follow it. I am very much a proponent of wind energy off our shores and see that the beneficial impacts will certainly have to outweigh the adverse impacts but that they can also not be done at the cost of serious socioeconomic adverse impacts or ecological impacts. Thank you very much for the opportunity to speak, and I'll turn it back over to you, Marcy.	
BOEM-2022-0071-0284-0002	So again, that" s Fred Zalcman. Last name is spelled Z- A- L- C- M- A N, and I" m with the New York Offshore Wind Alliance. So again, thank you for allowing me to speak today in support of the Sunrise Wind Project, and to urge the prompt approval of the project" s construction and operation plan. As I indicated, my name is Fred Zalcman, I" m the director of the New York Offshore Wind Alliance. We're a diverse coalition of the world" s leading offshore wind, project developers, environmental NGOs, labor, and other supporters all joined together to support the development of a robust and responsible offshore wind ecosystem in New York State. The Sunrise Wind Project is a critical component in New York" s nation- leading effort to power its economy based entirely on clean, renewable, and carbon- free energy sources, New York" s Landmark Climate Leadership and Community Protection Act. The project will provide enough electricity to serve the equivalent of 600,000 New York households and represents a significant down payment towards decarbonizing New York" s grid. Studies indicate that New York will need nearly 20 gigawatts of offshore wind by 2050 to meet its decarbonization objective. And the Sunrise Wind Project is the first albeit, critically important step in that journey, instilling the confidence of diverse stakeholders from investors, workers, local communities, and ocean users, that this nascent technology can be deployed responsibly and at scale to meet our most pressing energy environmental and equity challenges.	Thank you for your comment.

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	Indeed, the Sunrise Wind Project is about much, much more than carbon- free electrons that will eventually produce. For example, the Sunrise Wind Project is the impetus for the developer's significant investment in and modernization of New York" s port infrastructure. Including the transformation of the Port Jefferson Harbor into a regional operations and maintenance base for Ørsted's portfolio of Northeast projects, creating hundreds of permanent high- quality, high- paying jobs over the 30 - plus years year operating life of these wind farms. And speaking of jobs, Sunrise Wind is investing heavily in workers. In collaboration with the union, construction, trades, academia, and local government, the Sunrise Wind Team is standing up the nation" s first training institute for the advancement of skills requisite to meet the offshore wind industry" s growing needs. The project is also helping to restore Upstate New York" s proud manufacturing legacy with investments like the one with Wellsville, New York-based Ljungstrom to fabricate advanced foundation components. The proponents of Sunrise Wind have developed the project with great care to avoid, minimize, and mitigate the potential negative impacts. The project" s construction and operation plan is the result of several years of careful study stakeholder consultation, negotiation, and design to account for the project area's distinct geotechnical and geophysical characteristics, biology, and maritime uses. For example, the project" s turbine layout in a one nautical mile by one nautical mile east- west grid pattern was developed with significant input from the US Coast Guard joining leaseholders and commercial fishers to accommodate the safe navigation in and through the Sunrise Wind Lease area. As the DEIS reveals, the vast majority of impact areas are rated at moderate or below, with remaining residual impacts amendable in mitigation. So, thank you again for this opportunity to touch on some of the many unique benefits of this cutting- edge project. I urge BOEM to move carefully, but expeditiously to a final EIS, and COP approval.	
BOEM-2022-0071-	Dear Program Manager:	Thank you for your

Comment No.	Comment	Response
0081	I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. American Offshore Services LLC (A-O-S) is a New Bedford, Massachusetts-based CTV owner and operator, providing personnel and equipment transportation to offshore wind farms and installations with custom-made vessels built in the US. We have the unique opportunity to build the future of the energy industry in our country. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working. Sincerely, Clark Buffam Managing Director	comment.
BOEM-2022-0071-	Dear Program Manager:	Thank you for your

Comment No.	Comment	Response
0074	I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. Vaisala is a global leader in weather, environmental, and industrial measurements. Building on over 85 years of experience, Vaisala provides observations for a better world, with space-proof technology even exploring Mars and beyond. We are a reliable partner for customers around the world, offering a comprehensive range of innovative observation and measurement products and services, including the renowned WindCube suite of lidars for wind measurement. We have the unique opportunity to build the future of the energy industry in our country. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation’s energy security.	comment.

Comment No.	Comment	Response
	I urge you to approve this project on its current timeline and keep our industry working. Sincerely, Laura Lear Head of Global Marketing	
BOEM-2022-0071-0044	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. VHB's diverse team brings together our collective knowledge, technical excellence, and wide network of trusted relationships across our footprint to address our clients' most complex challenges. VHB's work helps improve mobility, enhance communities, build resilience, and contribute to economic vitality. Our holistic problem-solving philosophy is ingrained in all that we do, and each project considers environmental, social, and economic factors that result in sustainable solutions. VHB collaboratively applies technical skills anchored in this philosophy to deliver lasting results that help communities thrive for generations to come. We have the unique opportunity to build the future of the energy industry in our country. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder	Thank you for your comment.

Comment No.	Comment	Response
	further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working.	
BOEM-2022-0071-0029	Dear Program Manager: I am writing to you today in support of the Sunrise Wind project. As America grows its offshore wind industry, we have the opportunity to shape the future of the energy market in the United States. At HeliService USA we are proud to be providing environmentally friendly offshore transportation in support of Sunrise Wind. Utilizing aircraft we minimize the impact on local marine life and consume less carbon than alternative options. We're proud to have been chosen by Ørsted to provide these services and appreciate their focus on protecting the environment. As a Rhode Island based company we are staffed locally and will be hiring dozens more employees over the coming years. We also believe in supporting those who've served and well over 50% of our current employees are veterans. These are extremely well-paying jobs that support development of the local economy. Timely approval of this project is critical to us reaching our employment targets and our full level of staffing. Any delays could mean potential staffing cuts. We have the unique opportunity to build the future of the energy industry in our country. We are uniquely positioned to build the future of the green-energy industry in the US through the creation of lucrative job opportunities that will be sought after by those looking to build their American dream, create families, and purchase homes. We have the opportunity to create a green economy that will save our planet and deliver the next generation a cleaner environment and stronger future. It is a rare opportunity to get in on the ground floor of an economic revolution. This is our window to impact the future through the creation of new relationships, supply lines, and new markets. We are proud to be a part of this revolution. BOEM provided	Thank you for your comment.

Comment No.	Comment	Response
	multiple alternatives for further review. Within those alternatives, there is one that BOEM should not consider – No Action. No Action could hinder further development of the U.S. offshore wind domestic supply chain. The supply chain needs clarity and confidence that projects can move forward, and in a timely manner. We need Sunrise Wind to be built. Sunrise Wind is good for the economy, environment, and our nation's energy security. I urge you to approve this project on its current timeline and keep our industry working.	

O.7.2. General Opposition

Table O-35. General Opposition Comments

Comment No.	Comment	Response
BOEM-2022-0071-0013	Once again. No. https://dgrnewsservice.org/civilization/ecocide/climate-change/how-many-more-dead-whales/?utm_source=DGR+News+Service&utm_campaign=19bd79de17-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_51489b99cd-19bd79de17-481430028	Thank you for your comment.
BOEM-2022-0071-0014	These wind turbines are. BAD idea. They are fossil fuel dependent. The energy it takes to mine, manufacture, install and operate over ride any benefit. They are also not efficient. They will cause more weather storms. They kill wildlife. They are noisy. They are ugly. They are destructive. Please stop these wind farms. They are worse than oil. Please plant trees.	Thank you for your comment.
BOEM-2022-0071-0016	At the outset, I state that I am in favor of developing wind power as a viable source of energy for our future. After examining the Mitigation and Monitoring document I have some questions and concerns before this project moves forward. The use of language like "to the extent practicable" seems like a vague enough loophole since the public does not really know what the corporation doing the work deems "practicable". Also, though the fishing industry, recreational fishing, and "protected species" have much specificity devoted to their concerns, it seems to me that ALL marine mammals are protected species (as of 1972). What, exactly, is "incidental" loss or damage to these mammals? How many is too many. We do not want to drive successful marine mammals into the same category as the North Atlantic Right Whale! At present, several other species of whales have washed up dead and at least one was caused by boat strike. Would these be considered "incidental"? Mitigating damage to bird and bat populations is critical. Has this corporation drawn from the experience of other companies in other countries where wind farms are in extensive use? How much of this prior experience has gone into the pre-construction planning of this off-shore development? What studies have been conducted regarding flight patterns, migration patterns, animal navigation systems? I would appreciate even more details shared with the public, people who have no technical or biological training, so that we can better understand the risks here, along with the benefits.	Thank you for your comment.
BOEM-2022-	This is a matter of national security and environmental concern. How can one foreign company	Thank you for your

Comment No.	Comment	Response
0071-0025	own the bulk of the power generation sold to half the country's population? You are killing our whales and our marine life. Destroying the last natural space has left.	comment. Marine Mammals are discussed in Section 3.11.
BOEM-2022-0071-0026	Industrialization of our oceans is insane. Will destroy tourism, tourism jobs, property values, marine ecosystems, navigation and both commercial and recreation fishing. Furthermore federal scientists warned against this and should not be ignored!	Thank you for your comment. These topics are discussed within the Final EIS under the following sections: Section 3.7, *Benthic Resources*, Section 3.10, *Finish, Invertebrates and Essential Habitat*, Section 3.14, *Commercial Fisheries and For-hire Recreational Fishing*, Section 3.16, *Demographics, Employment and Economics*, Section 3.18, *Land Use and Coastal Infrastructure*, Section 3.19, *Navigation*, and Section 3.21, *Recreation and Tourism*.
BOEM-2022-0071-0027	Industrialization of our oceans is insane. Will destroy tourism, tourism jobs, property values, marine ecosystems, navigation and both commercial and recreation fishing. Furthermore federal scientists warned against this and should not be ignored!	Thank you for your comment. This comment is a duplicate of comment submission BOEM-2022-0071-0026.
BOEM-2022-	Off shore wind farms harm the environment and disorients sea life. These projects were not	Thank you for your

Comment No.	Comment	Response
0071-0101	properly vetted and researched prior to execution. These wind farms need to be stopped or at the very least researched far more. The next issue is the fact the blades cannot be recycled and properly repurposed, and or disposed of. Wind farms, in general have not thoroughly vetted, and also kill birds at an alarming rate, and also do not generate sufficient amounts of power to warrant the devastating actions and sound waves to marine life and to bird life. I do not support windfarms, I do support green energy solutions and wish for them to be many more but currently marine-based wind farms are not a solid solution, especially in low depth situation's such as Long Island sound this project must be prevented, and/or slow down to do far more research before it can continue . I am not in support of these projects and do not work for them to proceed. At the current moment I will vote against any, and all projects until a solid green energy solution is devised and put up for proper public debate that does not harm the environment and the creatures in our environment.	comment.
BOEM-2022-0071-0116	I am absolutely against this project! I am extremely concerned about our sea life both land and sea! I also do not want our beautiful ocean view filled with these monstrosities. I am very angry that they chose our beautiful Smith Point National Sea Shore for this nightmare project. I live near William Floyd Pkwy the construction as they install the cables will effect me greatly.. I have lived here all my life enjoying our beautiful great South Bay and the ocean and I'm terrified that those turbines will be seen by boaters who frequent the moriches inlet and ocean. 100 % AGAINST THEM!! I do not think they are a solution and I've heard many negative things about them, They will greatly affect our sea life including sea birds.	Thank you for your comment.
BOEM-2022-0071-0117	It is time to slowdown all windfarm projects on the east coast, specifically the northeast coast. They are killing our whales, birds and other ocean mammals. Stop the windfarms now before you kill more of our creatures.	Thank you for your comment.
BOEM-2022-0071-0128	STOP THIS WINFARM IMMEDIATELY!!!!!! 11 WHALES IN 3 MONTHS IS TOO MANY!!! THEY ARE CONFUSED AND GETTING HIT BY BOATS OR WHATEVER IS HAPPENING TO THEM! PLEASE STOP THIS IMMEDIATELY!!!! EVEN IF THERE IS A TINY CHANCE THESE EVENTS ARE RELATED, EVERY WHALE LIFE IS IMPORTANT!!! STOP THESE WINDFARMS IMMEDIATELY!! THEY WILL ALSO KILL MANY OF OUR OCEAN BIRDS!!!! WE ALL WANT CLEAN ENERGY, BUT NOT AT THE EXPENSE OF OUR BELOVED WILDLIFE!!!! VIRGINIA MATNEY	Thank you for your comment.

Comment No.	Comment	Response
BOEM-2022-0071-0131	Watch out for the poor whales. Where is the redundancy in wind energy. Where is the back-up when wind blows less 5 mph on a cloudy day.	Thank you for your comment.
BOEM-2022-0071-0160	First of all, why do we insist of locating these windmills offshore? The cost makes this unreasonable. Let me preface that I am very pro wind power, however did the fact that these are located in salt water? Maintenance will require a calm sea to work on these windmills, we have seen a very large number of both whales washed up from the sonic equipment, large amount of birds striking these windmills blades, and the long range plan to have sustained wind power would be more logical to have these built on concrete, creating more windmills erected at a much cheaper price	Thank you for your comment.
BOEM-2022-0071-0179	this sounds like a bad idea. i think that too many birds will be injured by this also as a power plant worker i know that there is a loss of power as it is shipped. this means that if you use power far from where you generate it that it is wasteful. we dont use a lot of power in the ocean.	Thank you for your comment.
BOEM-2022-0071-0180	While it is imperative that we adopt renewable sources of energy I must caution that the mechanisms and processes to procure, transmit, store, and deliver the energy must meet requirements for any other industrial process- being "green" does not lessen this requirement. The Sunrise Offshore Wind Farm will generate power using large complex structures placed in a wilderness- The near-shore Atlantic Ocean. The transmission lines will be constructed and operate in the sea floor, through the littoral zone, through sensitive barrier beach, marshland, and lagoon (Bay) environs. Normally processes like energy production/ storage/ distribution are required to avoid sensitive areas and are restricted to areas zoned for industrial/ unrestricted commercial use. The plan to place the wind farm offshore and transmit the energy through these sensitive environs places a large burden on the project to make certain these environments are not damaged during construction, operation, maintenance, and decommissioning. I believe it would be much more prudent and effective to have a land-based operation on less sensitive ground where the negative effects of the construction and operation on the environment are more easily understood and mitigated. Respectfully; John Buckheit	Thank you for your comment.

Comment No.	Comment	Response
BOEM-2022-0071-0193	Offshore wind is very dirty, dangerous and inefficient. Benefits of offshore wind do not balance with the hazards to the environment. Please do not go ahead with this project. We desperately need alternative energy but this is not the solution. Please do not damage the environment in the process of trying to save it.	Thank you for your comment.
BOEM-2022-0071-0201	No wind farm, please. Dangerous to the environment. Birds, Mammals.	Thank you for your comment.
BOEM-2022-0071-0246	I oppose off shore wind farms because they will kill too many birds & marine life.	Thank you for your comment.
BOEM-2022-0071-0254	These wind projects have obviously had a negative impact on oceanic creatures such as the deceased whales that have washed up on the NJ shore.	Thank you for your comment.
BOEM-2022-0071-0264	I am 1000% opposed to the y green wind energy proposed by sunrise wind llc The environmental Impacts are so evident in whaling deaths, fish declines, and the EMF emitted by cables !! The servicing and construction of these mills which BTW are only 1/50 in service at any one time ! They freeze in winter, they cause seabird and migratory bird deaths - and the oils and lubricants they require are environmental Nightmares !! We are on the verge of announcing in the USA new zero impact, zero emission, lean and clear energy through equatorial magnetism and other new age technologies stiffelled and held in secret by the cabal and corrupt politicians !! Free and clean energy is REAL AND GREAT FOR THE EARTH AND ITS INHABITANTS … people and Animals !! We share this space and greedy fake wind energy companies are profiting from your ignorance. STOP R*PING OUR EARTH WITH FAKE WIND PROMITING FAKE CLEAN ENERGY !! VOTE NO TO WIND FARMS !!!! All of them !!	Thank you for your comment.
BOEM-2022-	I am completely against wind farms being implemented on Long Island and along our shores. I	Thank you for your

Comment No.	Comment	Response
0071-0276	will work hard to stop these from coming to fruition.	comment.
BOEM-2022-0071-0282-0008	Mike Conroy, C- O- N- R- O- Y, Responsible Offshore Development Alliance. I hadn't planned on offering verbal comment, but you know, I felt compelled to after hearing some of the -- some of the prior comments. Unlike others, you know, the commercial fishing industry still feels as if it is not at the table, but rather at the menu when it comes to discussing Offshore Wind. Prior comments have touted both the economic and the environmental benefits of Offshore Wind. When talking about economic benefits, we heard about jobs. Yes, it's undisputed that that jobs will be created, how many of these will be long- lasting I think remains to be seen but we must be mindful that there will be job losses. In New York alone, the commercial fishing industry accounted for roughly 3000 jobs in 2019 , that from a March 2022 NMFS report discussing fisheries economics of the US. And if you look across the entire mid- Atlantic region, which includes New York, New Jersey, Delaware, Maryland, and Virginia, that number is just below 30,000 jobs. The commercial fishing industry along the eastern seaboard is comprised of many small businesses. Not all of these businesses will be able to survive the incursion of the Offshore Wind Industry. This will surely negatively impact the shoreside businesses, which are dependent upon the fish harvested by our commercial fishermen and women. We must not forget the importance of our food security, which our domestic harvesters are a key element. We do not dispute the need to reduce our reliance on fossil fuels. We have always advocated for responsible development on the outer continental shelf. Unfortunately, the current BOEM process does not allow for a truly transparent public process at the outset from the siding decision- making process. Telling the ocean users where offshore wind is to be placed is vastly different than asking those users where offshore wind can be located, which will avoid impacts to those users, or at the very least, minimize those impacts which are unavoidable. Offshore wind is being touted as the answer to all of our climate issues, but Offshore Wind is not without its problems. Study came out in November, which found that offshore wind will change marine ecosystems. In May, NMFS, office of protected resources sent a letter to BOEM	Thank you for your comment.

Comment No.	Comment	Response
	highlighting concerns regarding impacts on lower levels of the food chain, which could have population impact to the critically endangered North Atlantic right whale. And over the last two months, at least seven whales have washed up on beaches in the area. I think contrary to what a prior speaker claimed, I do believe there was some survey work that was taking place during that timeframe. It may not have been for the Sunrise project, but I do believe there's been some survey work ongoing. And -- and like others, we will be submitting more detailed comments on or before the public comment deadline. Thanks.	
BOEM-2022-0071-0282-0010	My name is Ricardo Sanchez. I do not represent any organization other than the apparently growing number of citizens concerned with the speed with which the Offshore Wind project is growing, particularly in contrast to the much lower speed with which we are improving our understanding of the potential negative impacts of the project. A good example that would give some illustration to that idea of the slow progress in understanding of negative impacts is the April 22nd document by BOEM on the business of the open loop cooling systems. Basically, it's a short document that in virtually every paragraph closes with -- well, we really don" t know. You know, for example, the elevation of temperatures may indeed force some animal capital to move from those warm waters, but then again, some fish may actually like to be in warm waters, you know, and that kind of thinking is throughout that document that really makes you think that will be really wise to wait until we actually figure out the quantitative impacts of these intervention before we just jump into building it. There is, for example, mention of some alternative cooling theory. However, that research only will finish by 2023, and by then we obviously be very deep into the project. So, a little bit of calm on actually racing to build this until we really understand the negative implications that can come in. Are really the whales threatened? It looks like they might be.	Thank you for your comment.

Comment No.	Comment	Response
	Well, why don't we actually really figure that out instead of saying, well, it appears that maybe, yeah, there was a connection. We don" t know. We have the know- how to actually figure out these things. And I don" t think it's being applied with equal enthusiasm compared to the enthusiasm of just building these things. That would be the extent of my comment.	
BOEM-2022-0071-0282-0011	My name is Constance Gee. C- O- N- S- T- A- N- C- E. Last name Gee, G- E- E. I had not -- I have nothing prepared. I had just tuned in to listen to this. This is the first time I've had the privilege of -- of listening to this sort of hearing. I live right at the Rhode Island- Massachusetts Border right on the water. And as I listen to the previous speakers, it seems like people have a lot to say that represent big organizations or universities that have been doing a lot of work with Ørsted and probably have taken money from Ørsted in some way or the other. And -- and they have nothing to say, but great things! And I've heard a speaker say that this idea of - that is going to -- that more fish are going to enjoy the area because of the -- because of the reefs, the artificial reefs that each one of the monopoles will -- will form. Oh, that that's a scientifically proven fact. I don't really think that's true. I think a lot of things that are being said tonight and everybody's patting each other on the back about it. I don" t think a lot of this is proven. I don't think there's a lot of good studies that have been done as the previous speaker was saying about what is happening with the whale deaths. Yes, I know that there has been a large amount of whale deaths over the past few years, but not in that particular area where I do believe that there was sonar testing going on, looking for cabling, where they're going to put the cabling and the monopoles. So, it's just – it's moving very fast. Also, the -- I" m concerned about the open water- cooling system. A previous speaker said that you had those in New York at a coal plant, power plant, and those would be closed down. Well but it's going to be moved over to Rhode Island. It seems to me like this should be a lot closer to New York than it is if the energy is going to New York. I'm sorry, I don't mean to be NIMBY here. I know that's a big charge, but I'd like to know more if you could tell us more about the open water- cooling system, the 8 million gallons of water it takes in every day and spews back out at what 90 degrees or something? I mean it's -- but we are changing the environment out	Thank you for your comment.

Comment No.	Comment	Response
	in our ocean at an incredible breakneck speed, especially as we put up thousands of these huge offshore wind turbines and all of the cabling that goes with it and the cooling systems. It just seems like we're doing it so fast and we're really not hearing adequate environmental impact studies about how it" s going to affect marine life. So, I have great concerns as an individual citizen not representing any company, but thinking who speaks for -- who speaks for the ocean, who speaks for the whales, who speaks for the ocean? Everybody is just talking about, oh, it's going to be great economically, we're going to make this money. You know, we're all in for it. But I would just like to raise my hand to say I have some real concerns, and I think a lot of people do especially those of us who are going to be looking at about 2,000 of them off the shore and in the Rhode Island sound, and right in the middle of the most important winter- feeding ground for the North Atlantic right whale. So that's the extent of my comments but I have true concerns over this, and it breaks my heart to see how fast and furious everybody is going at this, who's going to make some money.	
BOEM-2022-0071-0283-0007	Okay, great. My name is Bonnie Brady. It" s spelled exactly like it is in the chat. B- O- N- N- I- E, Brady B- R- A- D- Y. I" m the executive director of the Long Island Commercial Fishing Association. I" m sorry, someone put my hand down after I had raised it, so I'm sorry for the problem. Now, I guess we start the clock going now. We are not in support of this project seriousness in anything that could affect the population level of Southern New England Cod stocks. I'm going to refer to the letter that you all had received regarding the South Fork project, which is right next door to Revolution Wind, and is only about one- seventh of the size of what revolution is but the issues are specifically regarding this, that the pile driving, the sound, the unbound effect it's going to have on future responding behavior. Anyway, I don't know who that was. In a letter that was sent to James Bennett on October	Thank you for your comment.

Comment No.	Comment	Response
	25th of 2021, it specifically discussed BOEM" s response to NOAA"s EFH conservation recommendations for the South Fork Project, which is right next door. And it spoke specifically that this project and other -- other sources that are going to be for other wind farms have a high risk of population-level impacts on Southern New England Cod. It states the fact that BOEM did not listen to the time of year recommendations regarding, I believe protecting spawning cod on Cox" s Ledge. It stated that acoustic masking was the only environmental stressor that BOEM stated and that it " ceases as soon as the noise source stops," which is not true according to the National and Fisheries service. As they said, no support was provided for that conclusion, and the conclusion did not appear to be supported by peer review literature. Specifically, also it refers to the fact that there was an assumption by BOEM that no lingering effect and minimal impacts to Cod" s spawning aggregations that was inconsistent with the assessment of impacts that you presented for the Suffolk Plan, and for this DEIS, it seems to have been copied into it. There is a severe concern that not only by doing the initial work, which included bulldozing the ocean floor with the Ospate 400 (sic) destroying possibly centuries of glacial marine, pile driving, the larvae, and keeping the spawning cod out of the area could lose one of the last somewhat healthy stocks of codfish that we have in New England. Additionally, I heard Ms. Lapp refer to the cooling water intake system. It is kind of ironic that Joe Martens, who was the commissioner of the Department of Environmental Conservation during that time period, was the one that put a law forward that made it illegal to have any type of cooling water intake system that was an open system, and that they had to be completely closed. They were going to be made illegal in all New York land and or those that draw water, as in, I believe Caithness. So, you" re planning on taking 8.1 million gallons per day, sucking it out, and spitting it out as 90 -degree effluent in the water column where areas of water don’t necessarily mix. And then the area of, I believe, 94 turbines, forgive me if I’m off by one or two, with the now documented wind wake effects, which actually can warm sea surface temperature. And additionally, take place up to 60 kilometers behind the site with warming of sea surface temperature, and a decrease in upwelling and downwelling.	

Comment No.	Comment	Response
	I find it shocking that none of the other environmental organizations have taken the time past the rudimentary climate change issues to look about thinking globally, but acting locally when it comes to this project. We do not support it. Thank you.	
BOEM-2022-0071-0283-0010	Sure. My name is Blair Bailey. I" m the General Counsel to the New Bedford Port Authority. It" s B- L- A- I- R, Bailey, B- A- I- L- E- Y. I" d just like to make a couple comments on the -- on the EIS. First, a couple general comments. As was noted at the beginning of this, there are now 27 active leases for offshore wind areas in the Atlantic. And we still don't have fisheries mitigation guidance from BOEM. The first mitigation document that BOEM put out was in 2012 , now we're considerably later and we still don't have the document. As a more specific comment, there's a couple of things. This is the second EIS that I've seen lately from BOEM where the evaluation of the No- action Alternative essentially says that doing nothing is going to have the same impact on commercial fishing as building the turbines. And the reason given for that is essentially all the other areas that BOEM has already approved, combined with NOAA fishing regulations, combined with global warming, fishing essentially is going to have -- have the same downfall as constructing 94 turbines in this area. With all due respect to BOEM, it's a little self- serving to approve an environmental impact statement and say the No Impact Alternative is exactly the same as the BOEM because we've already approved other wind areas. The other observation I would make is, as far as fisheries mitigation goes, and I put a question in -- in the -- in the questions, I know there" s reference to a fisheries mitigation plan. I haven" t been able to find it. It's not -- it" s referenced in the -- in Appendix H in the mitigation under the -- the EIS as not an enforceable part of it. And then BOEM goes on to say that there will be a fisheries mitigation compensation fund consistent with the draft guidance that was submitted, or as it may be amended and as I said, it" s -- it" s still not out yet, so we don" t know what that" s going to look like at the end of the	Thank you for your comment.

Comment No.	Comment	Response
	day. But there's no fisheries mitigation plan attached to the COP that I can see. The only reference anywhere is that it" s somehow available on the NYSERDA website. Just by way of reference as to who New Bedford, who we are here, we're essentially the port that's going to be most impacted by -- by any of the impact on the -- on the scallop fishery and other fisheries. We'll have 33 percent of the revenue from this particular area and most of the revenue from every other area in the New York Bight area. We bring in half a billion dollars a year in fisheries revenue and it's very concerning to us that while the race to put in offshore wind moves forward, there really isn't a lot of consideration given to the impact of lost revenue to both the fishermen and the ports that rely on these fishermen, the -- the shoreside businesses, the people employed by both the fishing industry and the shoreside businesses. So, my observation is the EIS doesn't really go far enough into requiring the mitigation that needs to happen. And that" s -- that" s it. Thank you.	
BOEM-2022-0071-0284-0003	Okay. Carl Van Warmerdam, C- A- R- L, V- A- N, W- A- R- M- E- R- D- A- M. I'm an advocate for the North Atlantic right whale, which there are 350 members left alive, whose only home is in the outer continental shelf of the eastern seaboard, which is where thousands of wind turbines are planned on being built. So, I'll start with what I stated yesterday, which is there" s no section in this DEIS for the North Atlantic right whale, which is critically endangered, the most critically endangered whale, and one of the most imperiled mammals on the planet. Thankfully, we have sea turtles, which are included, which are also critically endangered. That needs to be rectified, they should have their own section, and it should encompass the Draft BOEM NOAA strategy for the North Atlantic right whale that needs to be incorporated into this DEIS. Now, on the table ES- 2 , which is the summary, comparison of the impacts between alternatives with no mitigation measures, you've gone down the list and I don't -- I cannot understand how there's no difference if you take buts, there's no, no difference along any of the alternatives. They're all minor. That's illogical. And it goes down the list too. When there's no alternative, it's still stated as minor when there should be no effect.	Thank you for your comment.

Comment No.	Comment	Response
	Now, I know you're taking into consideration climate change, but are you taking into the consideration of what it costs to build these turbines on climate change, the materials that will need to be mined and manufactured, the habitat that will be destroyed in their making, the Balsa wood forests that will need to be cut to get those wind blades. Those all need to be calculated. And if you" re calculating climate change, those would definitely be offset. So all the -- you know, wind, wind is a renewable easy resource, correct. But the turbines that capture that energy are not. They're not clean, they're not green. They're, they're constructed and manufactured and use fossil fuel to produce. They will not eliminate carbon use, they will only add onto it. In the 50 years of renewable energy, carbon emissions have only increased. They're still increasing. If we want to decrease CO 2 emissions, we need to stop using fossil fuels. That means limiting air travel. No cruise line ships, cars. It doesn't matter what powers the car. You're still using metal that needs to be mined, which uses fossil fuels. The plants use fossil fuels. Those cars, whether they're electric or ICE, have wheels and tires. Where do those come from? So that all needs to be calculated in and should be figured into your scenarios. So, finishing up here, I really advise a no alternative on industrialization of our commons and the -- of what I would -- would say is extinction for the species of the right whale, they will destroy the zooplankton upon which they live and their only home. Thank you.	

O.7.3. Form Letters

Table O-36. Form Letter Comments

Comment IDs	Comment	Response
BOEM-2022-0071-0021 BOEM-2022-0071-0026 BOEM-2022-0071-0054 BOEM-2022-0071-0053 BOEM-2022-0071-0067 BOEM-2022-0071-0068 BOEM-2022-0071-0069 BOEM-2022-0071-0126	As a union member, I support offshore wind. Large scale utility development like Sunrise Wind and other offshore wind projects will not only reduce our carbon footprint but will also mean a tremendous amount of economic opportunity in the form of jobs and economic benefits. I strongly believe that Americans should not have to choose between a good job and a clean environment – we can and must have both. Orsted and Eversource's Sunrise Wind project is an opportunity to not only drive the nation's clean energy future, but create quality, family sustaining jobs at the same time. I urge BOEM to move forward with BOEM's permitting process.	Thank you for your comment of support.
BOEM-2022-0071-0032 BOEM-2022-0071-0033 BOEM-2022-0071-0036 BOEM-2022-0071-0046 BOEM-2022-0071-0048 BOEM-2022-0071-0139 BOEM-2022-0071-0148 BOEM-2022-0071-0230	As a resident of Greenport, NY, I support offshore wind and the Sunrise Wind project in particular. This project will create hundreds of jobs in NY and generate immense investment in the state. I support this project for the clean energy and opportunity it will create.	Thank you for your comment of support.

Comment IDs	Comment	Response
BOEM-2022-0071-0110 BOEM-2022-0071-0115 BOEM-2022-0071-0038 BOEM-2022-0071-0182 BOEM-2022-0071-0250 BOEM-2022-0071-0056	The advance of offshore wind is critical to achieving our clean energy goals and creating a healthier future for our children. As a resident of Lindenhurst, NY I write to urge BOEM to approve the permit application for Sunrise Wind so that we can begin to realize the benefits of this regionally significant clean energy project as soon as possible. We can't fight climate change without transitioning away from fossil fuels to renewable energy.	Thank you for your comment of support.
BOEM-2022-0071-0045 BOEM-2022-0071-0070 BOEM-2022-0071-0083 BOEM-2022-0071-0092 BOEM-2022-0071-0094 BOEM-2022-0071-0097 BOEM-2022-0071-0106 BOEM-2022-0071-0120 BOEM-2022-0071-0221 BOEM-2022-0071-0240 BOEM-2022-0071-0241 BOEM-2022-0071-0281	As a resident of New York, I support offshore wind and the Sunrise Wind project. This project will help New York transition from fossil fuels to renewable energy and create hundreds of jobs. It will be located over 30 miles offshore and connect in Brookhaven to bring renewable energy directly to 600,000 Long Island homes. I support this project because clean energy is important.	Thank you for your comment of support.

Comment IDs	Comment	Response
BOEM-2022-0071-0060 BOEM-2022-0071-0066 BOEM-2022-0071-0125 BOEM-2022-0071-0145 BOEM-2022-0071-0153 BOEM-2022-0071-0156 BOEM-2022-0071-0162 BOEM-2022-0071-0164 BOEM-2022-0071-0181 BOEM-2022-0071-0191 BOEM-2022-0071-0202 BOEM-2022-0071-0212 BOEM-2022-0071-0217 BOEM-2022-0071-0219 BOEM-2022-0071-0237 BOEM-2022-0071-0258 BOEM-2022-0071-0260 BOEM-2022-0071-0261	write in support of Sunrise Wind. Offshore wind projects are critical to solving today's environmental challenges in ways that both create and maintain quality jobs to build a stronger, fairer economy. Sunrise Wind alone is investing hundreds of millions of dollars in New York that will create hundreds of union jobs around the state. And once complete, the project will power more than 600,000 homes annually with clean energy. Orsted and Eversource, the project developers, have signed a Project Labor Agreement with the North American Building Trades and Local Building Trades Councils to ensure their projects will be built with local union labor. This important agreement gives us confidence that Sunrise Wind will be constructed under fair and equitable terms for members of our union family. I urge BOEM to support the approval of Sunrise Wind so that we may get to work, and many more residents can begin to realize the multi-faceted benefits of this important project.	Thank you for your comment of support.

Comment IDs	Comment	Response
BOEM-2022-0071-0063 BOEM-2022-0071-0064 BOEM-2022-0071-0127 BOEM-2022-0071-0154 BOEM-2022-0071-0170 BOEM-2022-0071-0173 BOEM-2022-0071-0174 BOEM-2022-0071-0190 BOEM-2022-0071-0199 BOEM-2022-0071-0204 BOEM-2022-0071-0210 BOEM-2022-0071-0220 BOEM-2022-0071-0224 BOEM-2022-0071-0225 BOEM-2022-0071-0228 BOEM-2022-0071-0234	I write in support of Sunrise Wind. Offshore wind projects are critical to solving today's environmental challenges in ways that both create and maintain quality jobs to build a stronger, fairer economy.	Thank you for your comment of support.
BOEM-2022-0071-0157 BOEM-2022-0071-0168 BOEM-2022-0071-0175 BOEM-2022-0071-0185 BOEM-2022-0071-0189 BOEM-2022-0071-0197 BOEM-2022-0071-0231 BOEM-2022-0071-0259	Sunrise Wind alone is investing hundreds of millions of dollars in New York that will create hundreds of union jobs around the state. And once complete, the project will power more than 600,000 homes annually with clean energy.	Thank you for your comment.

Comment IDs	Comment	Response
BOEM-2022-0071-0269 BOEM-2022-0071-0270 BOEM-2022-0071-0271 BOEM-2022-0071-0272 BOEM-2022-0071-0273 BOEM-2022-0071-0274 BOEM-2022-0071-0275	I fully support the Sunrise Wind project. This offshore wind farm will move us forward in the creation of sustainable energy alternatives. Future generations depend on such efforts to combat climate change.	Thank you for your comment of support.

O.8. List of Commenters by Commenter Type and Submission Number

Table O-37. Federal Agencies

Submission ID	Commenter	Agency
BOEM-2022-0071-0167	John M. Mauger	U.S. Coast Guard
BOEM-2022-0071-0255	Jonathan Meade	U.S. Dep of the Interior, National Park Service
BOEM-2022-0071-0256	Michael Pentony	NOAA
BOEM-2022-0071-0171	Timothy Timmermann	U.S. Environmental Protection Agency

Table O-38. State Government

Submission ID	Commenter	Government Organization
BOEM-2022-0071-0194	Lisa Berry Engler	The Massachusetts Office of Coastal Zone Management
BOEM-2022-0071-0244	Terrence Gray	Rhode Island Department of Environmental Management
BOEM-2022-0071-0245	Kisha Santiago, Sean Mahar and Tom Alworth	New York State Dep. of Environmental Conservation, New York State Dep. of State, New York State Office of Parks, Recreation, and Historic Preservation
BOEM-2022-0071-0257	Thomas McIntyre	New York Department of Transportation

Table O-39. Businesses and Organizations

Submission ID	Commenter	Organization
BOEM-2022-0071-0002	ECOncrete	ECOncrete
BOEM-2022-0071-0008	Relic	Relic
BOEM-2022-0071-0010	Brienne Ahearn	The Butterfly Effect Project
BOEM-2022-0071-0017	Deep Sea Defenders	Deep Sea Defenders
BOEM-2022-0071-0018	Woods Hole Group Inc.	Woods Hole Group Inc.
BOEM-2022-0071-0019	Local 338 RWDSU/UFCW	Local 338 RWDSU/UFCW
BOEM-2022-0071-0022	Global Maritime	Global Maritime
BOEM-2022-0071-0023	Matthew Aracich	Building and Construction Trades Council of Nassau and Suffolk Counties
BOEM-2022-0071-0024	Robert Mecarini	Alpine Ocean Seismic Survey, Inc.
BOEM-2022-0071-0029	Michael Tosi	HeliService USA LLC
BOEM-2022-0071-0031	Brian Vahey	American Waterways Operators
BOEM-2022-0071-0034	Dino Chouest	Edison Chouest Offshore and its family of affiliated companies
BOEM-2022-0071-0035	CWA Local 1109	CWA Local 1109
BOEM-2022-0071-0041	The New York League of Conservation Voters	The New York League of Conservation Voters
BOEM-2022-0071-0044	Kenneth (KC) Sahl	VHB
BOEM-2022-0071-0050	IBEW local 25	IBEW local 25
BOEM-2022-0071-0054	CSEA Local 330	CSEA Local 330
BOEM-2022-0071-0055	CSEA Local 330	CSEA Local 330
BOEM-2022-0071-0060	Randall Lambert	Millwrights Local 1163
BOEM-2022-0071-0061	Stanley Koniszewski III	Teamsters Local 294
BOEM-2022-0071-0062	Paul Nylin	IBEW Local 236

Submission ID	Commenter	Organization
BOEM-2022-0071-0063	IBEW LU#236	IBEW LU#236
BOEM-2022-0071-0064	Sheet Metal Workers SMART Local 83	Sheet Metal Workers SMART Local 83
BOEM-2022-0071-0065	Citizens Campaign for the Environment	Citizens Campaign for the Environment
BOEM-2022-0071-0066	Pat Tirino	BAC 2 NY/VT
BOEM-2022-0071-0068	District Council 9 Painters and Allied Trades	District Council 9 Painters and Allied Trades
BOEM-2022-0071-0069	Teamsters Local 1205	Teamsters Local 1205
BOEM-2022-0071-0070	Institute for Workforce Advancement	Institute for Workforce Advancement
BOEM-2022-0071-0071	Alvin Ramnarain	Local 1102 RWDSU/UFCW
BOEM-2022-0071-0072	Michael Gendron	Communications Workers of America 1109
BOEM-2022-0071-0074	Laura Lear	Vaisala
BOEM-2022-0071-0079	Jared Dent	Boskalis Offshore
BOEM-2022-0071-0081	Clark Buffam	American Offshore Services
BOEM-2022-0071-0086	Long Island Contractors' Association	Long Island Contractors' Association
BOEM-2022-0071-0087	Matthew T. Ferris	Arvos Ljungstrom LLC.
BOEM-2022-0071-0093	Green Energy Technology by JGM LLC	Green Energy Technology by JGM LLC
BOEM-2022-0071-0111	Maxwell Hall	Fisheries Liaison Officer
BOEM-2022-0071-0125	Roofers, Waterproofers Union Local 241	Individual Roofers, Waterproofers Union Local 241
BOEM-2022-0071-0126	Sean Moran	Laborers Local 190
BOEM-2022-0071-0127	Laborers Local 190	Laborers Local 190
BOEM-2022-0071-0133	Kevin Cawley	Thomas Berry Forum for Ecological Dialogue at Iona University
BOEM-2022-0071-0138	Stephen M. Zemaitatis Jr.	Riggs Distler & Company, Inc.
BOEM-2022-0071-0142	Dennis C. Affinati	IBEW - International Brotherhood of Electrical Workers - Third District

Submission ID	Commenter	Organization
BOEM-2022-0071-0145	Anthony Villa	Carpenters Local 290
BOEM-2022-0071-0147	Katie Almeida	The Town Dock
BOEM-2022-0071-0152	William Hougland	Haugland Group LLC
BOEM-2022-0071-0154	Chris Dugan	Carpenters Union Local 291
BOEM-2022-0071-0155	Lee Gooderham	Ordtek Limited
BOEM-2022-0071-0157	Zach Middleton	Millwrights Local 1163
BOEM-2022-0071-0158	Thomas A. Nies and Christopher M. Moore	New England and Mid-Atlantic Fishery Management Councils
BOEM-2022-0071-0159	Jim Murphy	New York State carpenters local to 91
BOEM-2022-0071-0161	Bryan Lohr	NYS Carpenters Union
BOEM-2022-0071-0163	Thaddeus Sendall	NYS Carpenters Union
BOEM-2022-0071-0165	Biofuel antagonists Global	Biofuel antagonists Global
BOEM-2022-0071-0166	Transport Workers Union Local 252	Transport Workers Union Local 253
BOEM-2022-0071-0170	Sarah Fergerson	IUOE Local 158
BOEM-2022-0071-0172	Timothy Midgette	NYS Carpenters Union
BOEM-2022-0071-0173	Michael Clifford	NYS Carpenters Union
BOEM-2022-0071-0174	North Atlantic States Regional Council of Carpenters	North Atlantic States Regional Council of Carpenters
BOEM-2022-0071-0176	Anthony Tubolino	International Operating Engineers Local 158
BOEM-2022-0071-0178	Daniel Reis	IBEW local 25
BOEM-2022-0071-0183	Andrew Raspanti	NYS Carpenters Union
BOEM-2022-0071-0186	Wilberto Arman	IBEW local 25
BOEM-2022-0071-0188	Tommy S.	IBEW local 25
BOEM-2022-0071-0192	Climate Jobs New York	Climate Jobs New York
BOEM-2022-0071-0195	Lenore Friedlaender	Climate Jobs New York

Submission ID	Commenter	Organization
BOEM-2022-0071-0198	Gordon M. Carr	New Bedford Port Authority Comment Letter
BOEM-2022-0071-0199	Edward Donlon	NYS Carpenters Union
BOEM-2022-0071-0200	Sierra Club	Sierra Club
BOEM-2022-0071-0203	Kerry Merkle	NYS Carpenters Union
BOEM-2022-0071-0204	Scott Griffith	NYS Carpenters Union
BOEM-2022-0071-0205	Jason Walsh	BlueGreen Alliance
BOEM-2022-0071-0206	Ross Gould	Business Network for Offshore Wind
BOEM-2022-0071-0207	Durwin Young	NYS Carpenters Union
BOEM-2022-0071-0208	Brian Wagner	Electricians Local #25
BOEM-2022-0071-0209	Renewable Energy Long Island (reLI)	Renewable Energy Long Island (reLI)
BOEM-2022-0071-0220	Joseph Brosnan	IBEW local 25
BOEM-2022-0071-0222	David Meers	NYS Carpenters Union
BOEM-2022-0071-0223	Marie Boyle	NEW YORK NURSING ASSOCIATION
BOEM-2022-0071-0224	William Drlfosse	NYS Carpenters Union
BOEM-2022-0071-0225	Robert Blaney	local union#25 Ives
BOEM-2022-0071-0226	Ryan Chaytors	Sunrise Wind LLC
BOEM-2022-0071-0227	Chris Lindsey and Andrew Dimitriou	SLR Consulting US LLC
BOEM-2022-0071-0228	Richard DiMitri	IBEW local 25
BOEM-2022-0071-0229	Meghan Lapp	Seafreeze Shoreside and Seafreeze Ltd.
BOEM-2022-0071-0232	Lisa Knight	Green Oceans
BOEM-2022-0071-0233	William W Czaikowski	local 25
BOEM-2022-0071-0234	Sam and Daniel Cordova	local 25
BOEM-2022-0071-0237	Timothy Morris	NYS Carpenters Union
BOEM-2022-0071-0238	HealthyPlanet	HealthyPlanet

Submission ID	Commenter	Organization
BOEM-2022-0071-0242	National Wildlife Federation, Natural Resources Defense Council, Conservation Law Foundation, et al.	National Wildlife Federation, Natural Resources Defense Council, Conservation Law Foundation, et al.
BOEM-2022-0071-0247	Andrew Cooper	Fugro
BOEM-2022-0071-0248	Lane Johnston	Responsible Offshore Development Alliance
BOEM-2022-0071-0249	William J. Cook	City of Newport, Newport Restoration Foundation, Preservation Society of Newport County, Salve Regina University, Town of New Shoreham, and Southeast Lighthouse Foundation
BOEM-2022-0071-0251	Bonnie Brady	Long Island Commercial Fishing Association
BOEM-2022-0071-0253	Billy Subject	NYS Carpenters Union
BOEM-2022-0071-0254	Finger Lakes	Finger Lakes
BOEM-2022-0071-0258	Anonymous	IBEW local 25
BOEM-2022-0071-0259	Anonymous	IBEW local 25
BOEM-2022-0071-0260	Anonymous	IBEW local 25
BOEM-2022-0071-0261	Anonymous	IBEW local 25
BOEM-2022-0071-0282-0002	Laura Fabrizio	Moriches Bay Project
BOEM-2022-0071-0282-0004	Helen Torkos	Chamber of Commerce
BOEM-2022-0071-0282-0005	George Povall	All Our Energy
BOEM-2022-0071-0282-0006	Maura Spery	Mastic Beach Conservancy
BOEM-2022-0071-0282-0007	Adrienne Esposito	Citizens Campaign for the Environment
BOEM-2022-0071-0282-0008	Mike Conroy	Responsible Offshore Development Alliance
BOEM-2022-0071-0282-0014	Adrienne Esposito	Adrienne Esposito
BOEM-2022-0071-0283-0001	Meghan Lapp	Seafreeze

Submission ID	Commenter	Organization
BOEM-2022-0071-0283-0002	Casey Petrashek	New York League of Conservation Voters
BOEM-2022-0071-0283-0003	Beth Wahl	President of the William Floyd Community Summit
BOEM-2022-0071-0283-0004	Nicole DiPaolo	Bluegreen Alliance
BOEM-2022-0071-0283-0005	Katie Cubina	Mystic Aquarium
BOEM-2022-0071-0283-0006	Stacy Sikes	VP of Gov Affairs and Communication at Long Island Association
BOEM-2022-0071-0283-0007	Bonnie Brady	Long Island Commercial Fishing Association
BOEM-2022-0071-0283-0008	Daniel Busi	Renewable Energy Long Island
BOEM-2022-0071-0283-0010	Blair Bailey	General Counsel to the New Bedford Port Authority
BOEM-2022-0071-0283-0011	Roger Clayman	Long Island Federation of Labor AFL-CIO
BOEM-2022-0071-0283-0012	Adrienne Esposito	Citizens Campaign for the Environment
BOEM-2022-0071-0284-0002	Fred Zalcman	New York Offshore Wind Alliance

Table O-40. Individuals

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0003	Aram Terchunian	
BOEM-2022-0071-0004	Eleanor Kobel	
BOEM-2022-0071-0005	Zeb Youngman	
BOEM-2022-0071-0006	Michael Daly	
BOEM-2022-0071-0007	William Tymann	
BOEM-2022-0071-0009	Alex Kravitz	
BOEM-2022-0071-0011	Aiden Kravitz	
BOEM-2022-0071-0012-0001	Kelsie Linell	
BOEM-2022-0071-0012-0002	Matt Linnell	
BOEM-2022-0071-0012-0003	Cpt. Robert Cabral	
BOEM-2022-0071-0012-0004	Robert Groves	
BOEM-2022-0071-0012-0005	Cpt. Scott Dernberger	
BOEM-2022-0071-0012-0006	Cpt. Scott Yerman	
BOEM-2022-0071-0012-0007	Tim Linell	
BOEM-2022-0071-0012-0008	Cpt. CJ Pinto	
BOEM-2022-0071-0012-0009	Gary Yerman	
BOEM-2022-0071-0013	Michelle Jones	
BOEM-2022-0071-0014	Patrice Tullai	
BOEM-2022-0071-0015	Bill Hoover	
BOEM-2022-0071-0016	Susan Goldberg	
BOEM-2022-0071-0020	Walter Barton	
BOEM-2022-0071-0021	Nick Hoh	
BOEM-2022-0071-0025	John Marks	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0026	Kevin Kernan	
BOEM-2022-0071-0027	Kevin Kernan	Duplicate comment to BOEM-2022-0071-0026
BOEM-2022-0071-0028	Esther Hernandez-Kramer	
BOEM-2022-0071-0030	Brian Tymann	
BOEM-2022-0071-0032	David Kapell	
BOEM-2022-0071-0033	Patricia Feeley	
BOEM-2022-0071-0036	Eileen Kapell	
BOEM-2022-0071-0037	Stephen Morvillo	
BOEM-2022-0071-0038	Paul Eidman	
BOEM-2022-0071-0039	Celeste Tymann	
BOEM-2022-0071-0040	Michael Hansen	
BOEM-2022-0071-0042	SM B	
BOEM-2022-0071-0043	Lucas Rodriguez	
BOEM-2022-0071-0045	Patricia Harper	
BOEM-2022-0071-0046	Caitlin Kapell	
BOEM-2022-0071-0047	Joseph Lopes	
BOEM-2022-0071-0048	Kathryn Kapell	
BOEM-2022-0071-0049	Timothy McCarthy	
BOEM-2022-0071-0051	Joseph O. Kommer	
BOEM-2022-0071-0052	Sean Meehan	
BOEM-2022-0071-0053	Kevin Casey	
BOEM-2022-0071-0056	Robin Spiegelman	
BOEM-2022-0071-0057	Lawrence Germano	
BOEM-2022-0071-0058	Thomas Lawless	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0059	James Pena	
BOEM-2022-0071-0067	Vanessa Jones	
BOEM-2022-0071-0073	Adelaide Fenton	
BOEM-2022-0071-0075	Jeffrey Stark	
BOEM-2022-0071-0076	Austin Martin	
BOEM-2022-0071-0077	Lewis Gross	
BOEM-2022-0071-0078	Peter McCartt	
BOEM-2022-0071-0080	Kevin McAleer	
BOEM-2022-0071-0082	Harish Yerramsetty	
BOEM-2022-0071-0083	Vincent Vertuccio	
BOEM-2022-0071-0084	Versha Gupta	
BOEM-2022-0071-0085	Pete Friedrich	
BOEM-2022-0071-0088	Marilyn Van Scoyoc	
BOEM-2022-0071-0089	Renee Toback	
BOEM-2022-0071-0090	Billy Mack	
BOEM-2022-0071-0091	Jack Polonka	
BOEM-2022-0071-0092	Madeleine Glick	
BOEM-2022-0071-0094	Joslyn Pine	
BOEM-2022-0071-0095	Peter Louis	
BOEM-2022-0071-0096	Mary Eagleson	
BOEM-2022-0071-0097	Kelly DeVine	
BOEM-2022-0071-0098	Kevin Grimes	
BOEM-2022-0071-0099	Patricia Brack	
BOEM-2022-0071-0100	Sherry Sass	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0101	Kevin Mcgirr	
BOEM-2022-0071-0102	Raymond LeCann	
BOEM-2022-0071-0103	Donna Creagh	
BOEM-2022-0071-0104	Zoe Strassfield	
BOEM-2022-0071-0105	Malarie McGinnis	
BOEM-2022-0071-0106	Jennifer Valentine	
BOEM-2022-0071-0107	Alphonse Leonette	
BOEM-2022-0071-0108	Jennifer Wootton	
BOEM-2022-0071-0109	Liberty Howell	
BOEM-2022-0071-0110	Kërstin Bongiovi	
BOEM-2022-0071-0112	Susan Bonadonna	
BOEM-2022-0071-0113	Nancy Bolan	
BOEM-2022-0071-0114	Lisa Tymann	
BOEM-2022-0071-0115	William Doyle	
BOEM-2022-0071-0116	JodyAnn Weinman	
BOEM-2022-0071-0117	Julie Barnes	
BOEM-2022-0071-0118	Barbara Karyo	
BOEM-2022-0071-0119	Debra Engelhardt	
BOEM-2022-0071-0120	Elizabeth Stack	
BOEM-2022-0071-0121	Ike Rauth	
BOEM-2022-0071-0122	Daniel Busi	
BOEM-2022-0071-0123	Jessica Tierney	
BOEM-2022-0071-0124	Clifford and Pearl Bove	
BOEM-2022-0071-0128	Virginia Matney	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0129	Felicia Metcalf	
BOEM-2022-0071-0130	John Van Sickle	
BOEM-2022-0071-0131	Richard Galli	
BOEM-2022-0071-0132	Jonathan Foster	
BOEM-2022-0071-0134	Amy Ziff	
BOEM-2022-0071-0135	Josh Lehman	
BOEM-2022-0071-0136	Jim Johnson	
BOEM-2022-0071-0137	Mary Troland	
BOEM-2022-0071-0139	Joshua Kapell	
BOEM-2022-0071-0140	Elizabeth Halliday	
BOEM-2022-0071-0141	Robert Berkowitz	
BOEM-2022-0071-0143	Anna Gedrich	
BOEM-2022-0071-0144	Steve Hopkins	
BOEM-2022-0071-0146	Frances Cerra Whittelsey	
BOEM-2022-0071-0148	Matthew Kapell	
BOEM-2022-0071-0149	Melanie Carnsew	
BOEM-2022-0071-0150	William and Jane Flinter	
BOEM-2022-0071-0151	April Thayer	
BOEM-2022-0071-0153	Scott Smith	
BOEM-2022-0071-0156	Jim Mason	
BOEM-2022-0071-0160	Peter Derkevics	
BOEM-2022-0071-0162	Alvin Sumpter	
BOEM-2022-0071-0164	Thomas Scheg	
BOEM-2022-0071-0168	Terry Middleton	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0169	Edwin Hill Jr	
BOEM-2022-0071-0175	David Strum	
BOEM-2022-0071-0177	Kevin Owen	
BOEM-2022-0071-0179	Carl Maurer	
BOEM-2022-0071-0180	John Buckheit	
BOEM-2022-0071-0181	John Casciano	
BOEM-2022-0071-0182	Susan Haynes	
BOEM-2022-0071-0184	John Clifford	
BOEM-2022-0071-0185	Brian Biche	
BOEM-2022-0071-0187	Kerri Tymann	
BOEM-2022-0071-0189	Kenneth Madore	
BOEM-2022-0071-0190	Jared Carroll	
BOEM-2022-0071-0191	Christian Worhle	
BOEM-2022-0071-0193	Kevin Halpin	
BOEM-2022-0071-0196	Brian Chebuske	
BOEM-2022-0071-0197	Nicole Grodner	
BOEM-2022-0071-0201	Helen Lawrence	
BOEM-2022-0071-0202	Michael Riello	
BOEM-2022-0071-0210	Joseph Berdini	
BOEM-2022-0071-0211	Brian Schinella	
BOEM-2022-0071-0212	Thomas Savino	
BOEM-2022-0071-0213	A.J. Cordero	
BOEM-2022-0071-0214	James Dellamore	
BOEM-2022-0071-0215	Dennis Current	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0216	C O F	
BOEM-2022-0071-0217	Michael Sweeney	
BOEM-2022-0071-0218	Chris Callahan	
BOEM-2022-0071-0219	Biggie Lyons	
BOEM-2022-0071-0221	Terri Brady	
BOEM-2022-0071-0230	Diana Gordon	
BOEM-2022-0071-0231	David Cordova	
BOEM-2022-0071-0235	Tom Albert	
BOEM-2022-0071-0236	Thomas Reichard	
BOEM-2022-0071-0239	William Adams	
BOEM-2022-0071-0240	Deborah Lombardi-Aiello	
BOEM-2022-0071-0241	Deborah Lombardi-Aiello	Duplicate comment to BOEM-2022-0071-0240
BOEM-2022-0071-0243	Daniel Sterk	
BOEM-2022-0071-0246	Mary Bridget Bohan	
BOEM-2022-0071-0250	B Ruth Montgomery	
BOEM-2022-0071-0252	Forrest Barnett	
BOEM-2022-0071-0262	Anonymous	
BOEM-2022-0071-0263	Anonymous	
BOEM-2022-0071-0264	Anonymous	
BOEM-2022-0071-0265	Anonymous	
BOEM-2022-0071-0266	Anonymous	
BOEM-2022-0071-0267	Anonymous	
BOEM-2022-0071-0268	Anonymous	
BOEM-2022-0071-0269	Anonymous	

Submission ID	Commenter	Other Applicable Information
BOEM-2022-0071-0270	Anonymous	
BOEM-2022-0071-0271	Anonymous	
BOEM-2022-0071-0272	Anonymous	
BOEM-2022-0071-0273	Anonymous	
BOEM-2022-0071-0274	Anonymous	
BOEM-2022-0071-0275	Anonymous	
BOEM-2022-0071-0276	Anonymous	
BOEM-2022-0071-0277	Anonymous	
BOEM-2022-0071-0278	Anonymous	
BOEM-2022-0071-0279	Anonymous	
BOEM-2022-0071-0280	Anonymous	
BOEM-2022-0071-0281	Anonymous	
BOEM-2022-0071-0282-0001	Tom Barracca	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0282-0003	Camden Ackerman	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0282-0009	Gary Yerman	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0282-0010	Ricardo Sanchez	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0282-0011	Constance Gee	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0282-0012	Scoot Yerman	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0282-0013	Carl Van Warmerdam	Transcript from January 18, 2023 meeting
BOEM-2022-0071-0283-0009	Michael Daly	Transcript from January 23, 2023 meeting
BOEM-2022-0071-0284-0001	Joseph Kommer	Transcript from January 19, 2023 meeting
BOEM-2022-0071-0284-0003	Carl Van Warmerdam	Transcript from January 19, 2023 meeting

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APPENDIX P: USACE 404(B)(1) ANALYSIS

Table P-1. Summary of the Applicant-preferred Route

Assessment Criteria	Applicant-preferred Route-Smith Point County Park Landfall 1	Notes
Submarine Export Cable (Outside 3 nm)		
Length of SRWEC from Offshore Converter Station to New York Boundary (3nm)	99.4 mi	
Cable corridor width	98 ft	This is the *disturbance* corridor, not the *survey* corridor
Acreage of cable w/o secondary cable protection	15.7 ac	52.7 ac (total maximum permanent footprint of the SRWEC-OCS with cable protection) - 23.7 ac (secondary protection, Table 3.3.3-5 in the COP) - 13.3 ac (crossing protection, table 3.3.3-5 in the COP) = 15.7 ac.
Acreage of cable w/ secondary cable protection	52.7 ac	
Wrecks and obstructions within cable corridor	0	
Significant Coastal Fish and Wildlife Habitat w/in cable corridor route	N/A	SCFWH does not extend beyond 3 nm
Submarine Export Cable (w/in 3 nm)		
Length of SRWEC from New York Boundary (3nm) to HDD Exit Pit	4.8 mi	
Cable corridor width	98 ft	This is the *disturbance* corridor, not the *survey* corridor
Acreage of cable without secondary cable protection	0.8 ac	2.3 ac (Total maximum permanent footprint of the SRWEC-NYS with cable protection) - 1.5 ac (secondary protection, Table 3.3.3-5 in the COP) - 0 ac (crossing protection, Table 3.3.3-5 in the COP) = 0.8 ac
Acreage of cable with secondary cable protection	2.3 ac	
Volume of secondary cable protection	2,346 cy	

Assessment Criteria	Applicant-preferred Route-Smith Point County Park Landfall 1	Notes
Proximity to USACE Borrow Areas	No civil works borrow areas are within the vicinity of the cable corridor	
Wrecks and obstructions within cable corridor	0	
Significant Coastal Fish and Wildlife Habitat w/in cable corridor route	SRWEC-NYS w/in 3 nm: Great South Bay - East, Smith Point County Park, Moriches Bay; Onshore Transmission Cable: Carmans River	No impact to Smith Point County Park or Carmans River
Cable Installation		
Note: Shortly after cable installation is completed, the trench will naturally backfill due to settlement of fluidized sediments, collapse of the trench walls, and/or by natural infill. Sunrise Wind does not anticipate any activities to actively backfill the trench. Cable installation requires excavation for utility construction and displaced material is incidental fallback. Thus, the cable installation is not subject to Section 404 review.		
Mechanical Plowing Method		
Volume of discharged material	N/A	N/A, method not intended to be used
Area of discharged material	N/A	N/A, method not intended to be used
Jet Plowing Method		
Volume of discharged material	0 cy	
Area of discharged material	0 sq ft	
Mechanical Cutting Method		
Volume of discharged material	N/A	N/A, method not intended to be used
Area of discharged material	N/A	N/A, method not intended to be used

Assessment Criteria	Applicant-preferred Route-Smith Point County Park Landfall 1	Notes
Controlled Flow Excavation Method		
Volume of discharged material	0 cy	
Area of discharged material	0 sq ft	
Pre-Cut Mechanical Plowing Method		
Volume of discharged material	N/A	N/A, method not intended to be used
Area of discharged material	N/A	N/A, method not intended to be used
Pre-Cut Dredging Method		
Volume of discharged material	N/A	N/A, method not intended to be used
Area of discharged material	N/A	N/A, method not intended to be used
HDD Offshore (Atlantic Ocean)		
Length	3,290 ft	
Excavated material from HDD exit pit	4,300 cy	
Excavated area at HDD exit pit	8,036 sq ft	
Temporary trench box area	1,000 sq ft	
Volume of temporary rock bags	0 CY	No temporary rock bags planned, just the temporary trench box.
HDD Intracoastal Waterway		
Length	2,640 ft	
Excavated material from HDD exit pit	N/A	N/A; exit pit is onshore
Excavated area at HDD exit pit	N/A	N/A; exit pit is onshore
Temporary trench box area	N/A	N/A; exit pit is onshore
HDD Carmans River		
Length	36 ft	
Excavated material from HDD exit pit	N/A	N/A; exit pit is onshore
Excavated area at HDD exit pit	N/A	N/A; exit pit is onshore
Temporary trench box area	N/A	N/A; exit pit is onshore

Assessment Criteria	Applicant-preferred Route-Smith Point County Park Landfall 1	Notes
Onshore Transmission Cable		
Length	17.5 mi	
Impacts to special aquatic sites (wetlands, mudflats, vegetated shallows etc.)	None	
Temporary Landing		
Dimensions	16' x 242'	
Number of piles	21	
Diameter of piles	16 in	
Volume of fill material	4.35 cy	Volume of water column filled
Area of fill material	150 sq ft	
Impacts to submerged aquatic vegetation	0 ac	

ac = acre(s), COP = Construction and Operations Plan, cy = cubic yard(s), ft = feet, HDD = horizontal directional drilling, , in = inch(es), mi = mile(s), N/A = not applicable, nm = nautical mile(s), NYS = New York State, OCS = Offshore Converter Station, SCFWH = Significant Coastal Fish and Wildlife Habitat, sq ft = square feet, SRWEC = Sunrise Wind Export Cable, USACE = United States Army Corps of Engineers

Table P-2. Summary of Other Landfall Options Screened by the Applicant and Reasonings for Exclusion

Location	Assessment Criteria				
	Logistics	Cost	Impacts to Aquatic Environment	Impacts to USACE Civil Works Projects	Impacts to Special Aquatic Sites
Excluded Smith Point County Park Landfall HDD B	Landfall HDD route excluded due to onshore crossing of existing telecommunications cable. SRW prefers to cross the existing telecommunications cable with the HDD drill path.	Similar costs to the preferred landfall HDD route.	Similar impacts as preferred Landfall HDD.	Similar proximity to Fire Island Inlet to Montauk Point (FIMP) Project as preferred Landfall HDD.	Similar impacts as preferred Landfall HDD.
Excluded Smith Point County Park Landfall HDD C	Landfall HDD route excluded due to offshore crossing of existing telecommunications cable.	Would have required additional logistics, secondary cable protection, and a longer route to cross the existing telecommunications cable, which would have cost more than the preferred Landfall HDD route. The additional cable protection at the location of the cable crossing would have also required a more costly solution due to the shallow water and high energy at the location.	The additional length of export cable and additional cable protection measures would have resulted in increased impacts to the aquatic environment.	Similar proximity to FIMP Project as preferred Landfall HDD.	Similar impacts as preferred Landfall HDD.

Village of Quogue Beach	Site excluded from further consideration based on limited space available for temporary work areas, the presence of floodplain and significant coastal and fish wildlife habitat, and the fact that the onshore portion of the cable would be longer than the preferred alternative. Quogue Beach would have approximately 30 mi (48 km) of onshore cable route to the Holbrook Station which is approximately 76% longer than the preferred route between Smith Point County Park and the Holbrook Station.	This landfall option would result in a longer onshore transmission cable route when compared to the preferred alternative; therefore, would result in higher overall costs. Given the cable is 76% longer than the route associated with the proposed landfall from Smith Point County Park, the costs would also be approximately 76% higher. It is unknown if a barge would be required at this site.	Site excluded due to the fact this route would result in greater terrestrial disturbance due to the increased length of the transmission route and/or potential conflicts with existing aquatic resources and anthropogenic uses. It is unknown if a barge would be required at this site.	The proposed landfall at Quogue Beach would potentially impact civil works beach renourishment projects such as FIMP Project. There are designated sand borrow areas spanning the length of approximately 4.7 mi (7.5 km), located 0.6 mi (1 km) offshore of the Quogue Beach, in order to access the potential landfall location cable routes would need to either traverse the borrow areas, which would not be permitted, or run parallel to shore for a significant length (1 to 1.5 mi [1.5 to 2.5 km]) in the nearshore area. Installation of a cable parallel to the shoreline in the nearshore, shallow, high-energy area would be extremely difficult and would have an increased likelihood of exposure over the life of the project.	Similar impacts as preferred Landfall HDD. Route would potentially have higher impacts to floodplains and have significant coastal fish and wildlife habitat impacts in comparison to the preferred route.

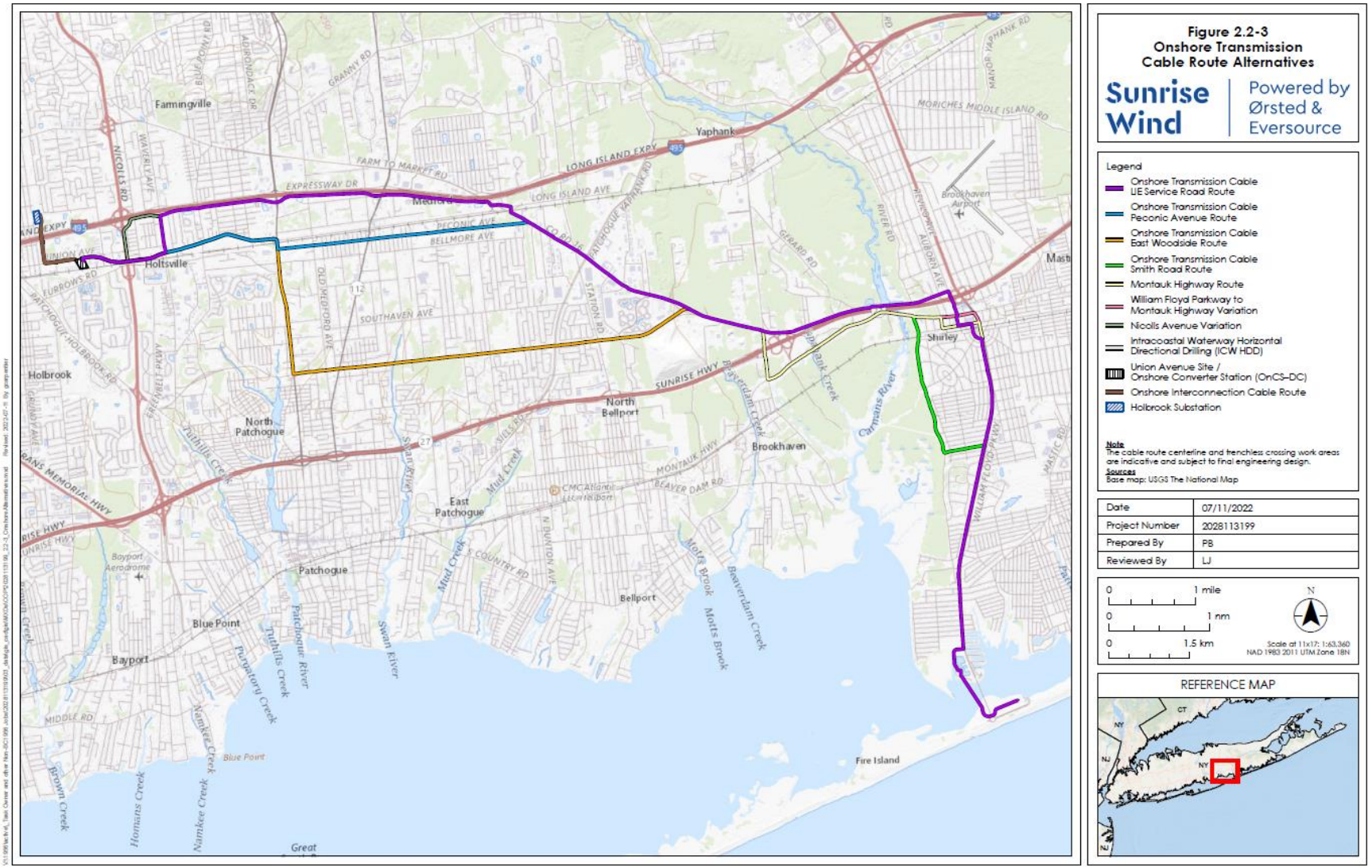
Coopers Beach	Site excluded from further consideration based on limited space available for temporary work areas, extended requirements for discretionary real estate approvals, and the fact that the onshore portion of the transmission cable would be longer than the preferred alternative. Holbrook. Coopers Beach would have approximately 38 mi (61 km) of onshore cable route to the Holbrook Station, which is approximately 124% longer than the preferred route between Smith Point County Park and the Holbrook Station.	This landfall option would result in a longer onshore transmission cable route when compared to the preferred alternative; therefore, would result in higher overall costs. Given the cable is 124% longer than the route associated with the proposed landfall from Smith Point County Park, the costs would also be approximately 76% higher. No barge would be required at this site.	Site excluded due to the fact this route would result in greater terrestrial disturbance due to the increased length of the transmission route and/or potential conflicts with existing aquatic resources and anthropogenic uses. No barge would be required at this site.	The proposed landfall at Coopers Beach would potentially impact civil works beach renourishment projects such as FIMP Project. There are designated sand borrow areas spanning the length of approximately 3.9 mi (6.3 km), located 0.5 mi (0.8 km) offshore of Coopers Beach, in order to access the potential landfall location cable routes would need to either traverse the borrow areas, which would not be permitted, or run parallel to shore for a significant length (1 to 1.5 mi [1.5 to 2.5 km]) in the nearshore area. Installation of a cable parallel to the shoreline. In the nearshore, shallow, high-energy area would be extremely difficult and would have an increased likelihood of exposure over the life of the project.	Similar impacts as preferred Landfall HDD. In the offshore vicinity of Cooper's Beach there are constraints that limit potential cable placement including mapped shipwrecks and a scuba-diving area.

Rogers Beach	Site excluded from further consideration based on limited space available for temporary work areas, close proximity to recreational areas, and the fact that the onshore portion of the transmission cable would be longer than the preferred alternative. Rogers Beach would have approximately 25 mi (40 km) of onshore cable route to the Holbrook Station, which is approximately 47% longer than the preferred route between Smith Point County Park and the Holbrook Station.	This landfall option would result in a longer onshore transmission cable route when compared to the preferred alternative; therefore, would result in higher overall costs. Given the cable is 47% longer than the route associated with the proposed landfall from Smith Point County Park, the costs would also be approximately 76% higher. It is unknown if a barge would be required at this site.	Site excluded due to the fact this route would result in greater terrestrial disturbance due to the increased length of the transmission route and/or potential conflicts with existing aquatic resources and anthropogenic uses. It is unknown if a barge would be required at this site.	The proposed landfall at Rogers Beach would potentially impact civil works beach renourishment projects such as FIMP Project. There are designated sand borrow areas spanning the length of approximately 4.7 mi (7.5 km), located 0.6 mi (1 km) offshore of Rogers Beach, in order to access the potential landfall location cable routes would need to either traverse the borrow areas, which would not be permitted, or run parallel to shore for a significant length (1 to 1.5 mi [1.5 to 2.5 km]) in the nearshore area. Installation of a cable parallel to the shoreline in the nearshore, shallow, high-energy area would be extremely difficult and would have an increased likelihood of exposure over the life of the project.	Similar impacts as preferred Landfall HDD.

Location	Assessment Criteria				
	Logistics	Cost	Impacts to Aquatic Environment	Impacts to USACE Civil Works Projects	Impacts to Special Aquatic Sites
Bellport Bay	Site excluded from further consideration because access to this site would require crossing of Fire Island through the Otis Pike Fire Island High Dunes Wilderness Area. Legislation prohibits the placement of utility lines here (or within any federally designated wilderness area). Additionally, this site was excluded due to private ownership and limited space available for temporary work areas as well as federal navigation channels. Stakeholder and regulatory communication also identified that selecting this area as a landfall site could negatively impact recreational and commercial fishing within Great South Bay.	Due to federal law and policy prohibiting NPS from granting permission for installation of a marine utility cable at any location within the Otis Pike Fire Island High Dune Wilderness Area, this landing was deemed infeasible; therefore, costs for this alternative landing were not evaluated.	Site excluded due to the fact this route would result in greater seabed disturbance due to the increased length of the export cable in NYS waters and the OCS and due to conflicts with existing anthropogenic constraints and uses including several additional existing cable crossings and recreational boating activity in Great South Bay. Crossing of the Great South Bay would likely exceed feasible HDD length and would require trenching, and crossing of the barrier island in NPS lands.	The proposed landfall at Bellport Bay would likely require trenching across the ICW and would also potentially impact civil works beach renourishment projects such as FIMP Project.	Similar impacts as preferred Landfall HDD. Site proximal to federally designated wilderness area and in Great South Bay East where there is increased concentration of submerged aquatic vegetation in the SE portion of the bay.

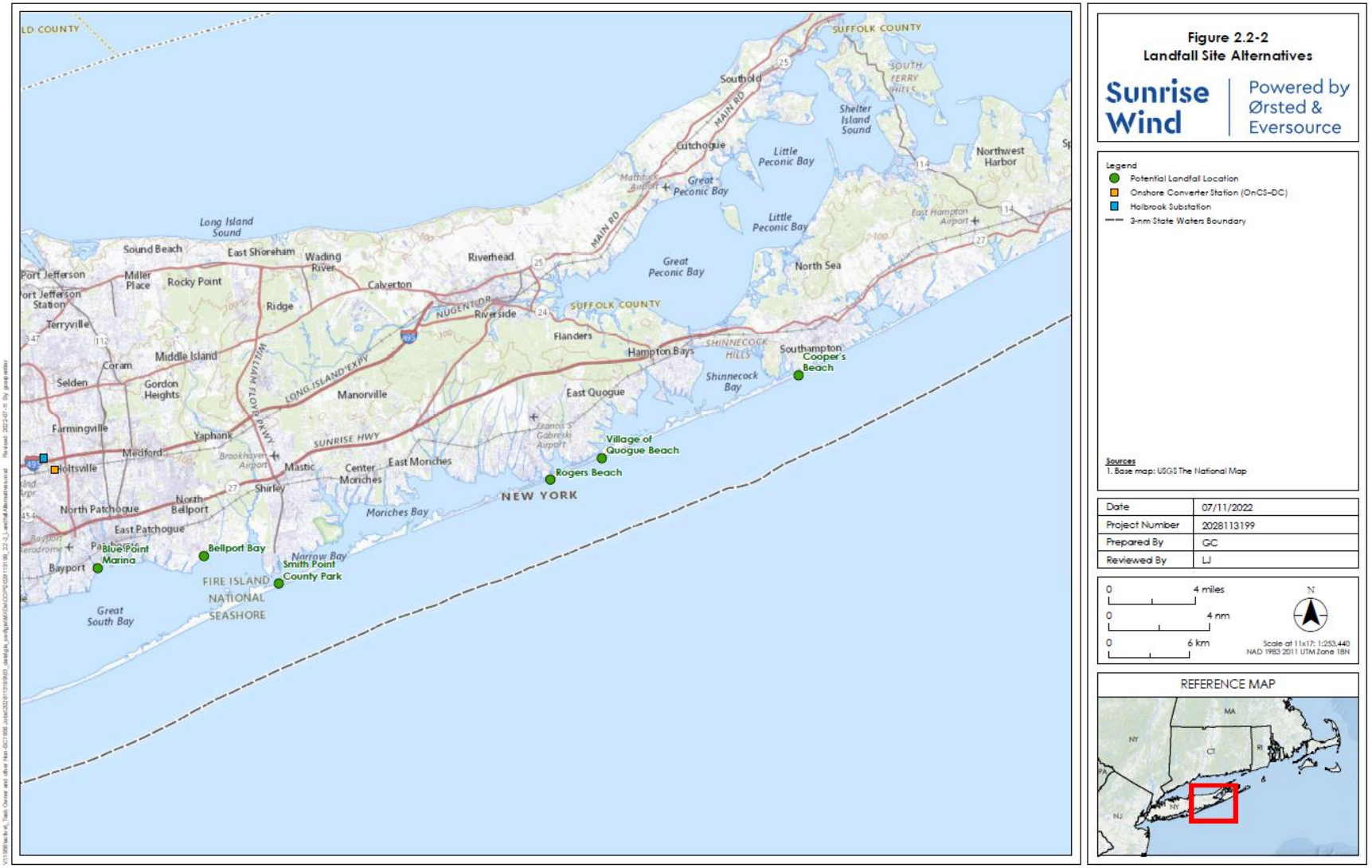
Location	Assessment Criteria				
	Logistics	Cost	Impacts to Aquatic Environment	Impacts to USACE Civil Works Projects	Impacts to Special Aquatic Sites
Bluepoint Marina/Corey Beach	Site excluded from further consideration because access to this site would require crossing of Fire Island through the Otis Pike Fire Island High Dunes Wilderness Area. Legislation prohibit the placement of utility lines here (or within any federally designated wilderness area). Additionally, this site was excluded due to limited space available for temporary work areas, as well as proximity to federal navigation channels. Stakeholder and regulatory communication also identified that selecting this area as a landfall site could negatively impact recreational and commercial fishing within Great South Bay.	Due to federal law and policy prohibiting NPS from granting permission for installation of a marine utility cable at any location within the Otis Pike Fire Island High Dune Wilderness Area, this landing was deemed infeasible; therefore, costs for this alternative landing were not evaluated.	Site excluded due to the fact this route would result in greater seabed disturbance due to the increased length of the export cable in NYS waters and the OCS due to conflicts with existing anthropogenic constraints and uses including several additional existing cable crossings and commercial recreational boating activity in Great South Bay. Crossing of the Great South Bay would likely exceed feasible HDD length and would require trenching, and crossing of the barrier island in NPS lands.	The proposed landfall at Bluepoint Marina/Corey Beach would likely require trenching across the ICW, and would also potentially impact civil works beach renourishment projects such as FIMP Project.	Site in close proximity to federally designated wilderness area and mapped submerged aquatic vegetation.

FIMP = Fire Island Inlet to Montauk Point NY Project, HDD = horizontal directional drilling, ICW = intracoastal waterway, NPS = National Park Service, NYS = New York State, OCS = Offshore Converter Station



Source: COP Figure 2.2-3; Sunrise Wind 2023

Figure P-1. Alternative Onshore Transmission Cable Routes



Source: COP Figure 2.2-2; Sunrise Wind 2023

Figure P-2. Alternative Landfall Sites

OCS EIS/EA
BOEM 2023-0056

Final Environmental Impact Statement for the Sunrise Wind Project

Appendix Q

Assessment of Resources with Minor (or Less) Impact Determinations in the Draft Environmental Impact Statement

BOEM
Bureau of Ocean Energy Management

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Sunrise Wind - Appendix Q: Assessment of Resources with Minor (or Less) Impact Determinations in the Draft Environmental Impact Statement

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3.4 Air Quality

This section examines the existing air quality conditions and the potential impacts on air quality from the Proposed Action, the alternatives, and future offshore wind farm development. The GAA (refer to Figure D-1 Appendix D [*Geographical Analysis Areas*]) covers the airshed within 15.5 miles (mi) (13.4 nautical miles [nm], 24.9 kilometers [km]) of the onshore components and ports, the area within 3.45 mi (3.0 nm, 5.6 km) of state borders, the area within a 25 mi (21.7 nm, 40.2 km) radius around the Sunrise Wind Farm (SRWF), and the offshore export cable.

3.4.1 Description of the Affected Environment and Future Baseline Conditions

The air quality of a region is described in comparison to National Ambient Air Quality Standards (NAAQS) which are standards for criteria air pollutants established by the USEPA pursuant to the Clean Air Act (CAA) (42 *United States Code* [*USC*] 7409). The CAA identifies two types of NAAQS: (1) primary standards to protect public health, including sensitive populations such as children, the elderly, and asthmatics; and (2) secondary standards to protect public welfare, such as protecting against decreased visibility and damage to crops, animals, or buildings (USEPA 2021a). The criteria pollutants are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), lead, particulate matter less than 2.5 microns ($PM_{2.5}$), and particulate matter less than 10 microns (PM_{10}). The current NAAQS for the criteria pollutants are provided in Table 3.4-1. Ozone is a secondary pollutant produced in the atmosphere from reactions involving sunlight, nitrogen oxides (NO_X), and volatile organic compounds (VOCs); thus, ozone does not have direct emission sources. Statewide pollutant emissions from the 2020 USEPA National Emissions Inventory are provided in Table 3.4-2 (USEPA 2023b). County level criteria air pollutant emissions from the counties where onshore activities and potential port facilities are located are provided in Table 3.4-3 (USEPA 2023b) .

Hazardous air pollutants (HAPs), or air toxics, are pollutants that are known to cause cancer or other serious health issues (USEPA 2021b). HAPs include pollutants such as VOCs, asbestos, and metals. USEPA regulates 188 HAPs.

Table 3.4-1. National Ambient Air Quality Standards for Criteria Pollutants

Criteria Pollutant	Primary or Secondary Standard	Averaging Time	Concentration	Form
CO	Primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Pb	Primary and Secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
NO_2	Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations averaged over 3 years
	Primary and Secondary	1 year	53 ppb	Annual mean
O_3	Primary and Secondary	8 hours	70 ppb	Annual fourth highest daily maximum 8-hour concentration averaged over 3 years
$PM_{2.5}$	Primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
	Secondary	1 year	15.0 µg/m^3	
	Primary and Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
PM_{10}	Primary and Secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
SO_2	Primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA 2023a

Notes:

CO = carbon monoxide, Pb = lead, NO_2 = nitrogen dioxide, O_3 = ozone, $PM_{2.5}$ = particulate matter less than 2.5 microns, PM_{10} = particulate matter less than 10 microns, SO_2 = sulfur dioxide, ppm = parts per million; ppb = parts per billion, µg/m^3 = micrograms per cubic meter

Table 3.4-2. Statewide Emissions of CO_2e (million metric tons of carbon dioxide equivalents [MMT CO_2e]) and Criteria Air Pollutants (tons per year)

State	CO_2e (MMT CO_2e) (year reported)	2020 EPA National Emissions Inventory (tons per year)[a]					
		CO	NO_x	SO_2	VOC	$PM_{2.5}$	PM_{10}
New York	194 (2019)[b]	1,313,310	198,393	11,436	647,496	101,178	297,593
Massachusetts	63.9 (2020)[c]	513,954	67,749	2,095	177,861	26,419	73,575
Connecticut	34.7 (2021)[d]	292,645	37,434	923	117,728	14,221	31,279
Rhode Island	10.0 (2019)[e]	80,966	12,225	396	30,094	4,408	9,141
Maryland	74.0 (2020)[f]	532,087	74,822	12,290	276,486	26,300	75,977
New Jersey	91.0 (2020)[g]	634,877	90,344	2,965	234,646	29,316	106,187
Virginia	137.2 (2019)[h]	1,043,762	167,594	17,696	1,047,035	76,031	194,078

Sources: [a]USEPA 2023a; [b]NYSDEC 2022; [c]Commonwealth of Massachusetts 2023; [d]CT DEEP 2023; [e]RI DEM 2022; [f]MD DE 2022; [g]NJ DEP 2022c; [h]VDEQ 2021.

Notes:

CO_2e = carbon dioxide equivalents, CO = carbon monoxide, NO_X = oxides of nitrogen, O_3 = ozone, $PM_{2.5}$ = particulate matter less than 2.5 microns, PM_{10} = particulate matter less than 10 microns, SO_2 = sulfur dioxide, VOCs = volatile organic compounds, MMT = million metric tons

Table 3.4-3 County Level Emissions (tons per year) from the 2020 National Emissions Inventory

State	County	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOCs
New York	Albany County	24,819	3,758	5,855	2,092	104	9,242
	Kings County	52,805	10,536	5,453	3,456	186	17,004
	New York County	78,300	13,225	17,143	5,690	343	13,240
	Suffolk County	132,193	13,595	11,015	5,228	311	27,971
	New York Total	288,117	41,113	39,466	16,466	944	67,457
Rhode Island	Providence County	41,031	5,615	5,579	2,341	93	14,051
	Washington County	12,281	1,586	1,272	684	26	5,716
	Rhode Island Total	53,312	7,201	6,852	3,025	119	19,767
Connecticut	New London County	24,167	3,187	3,488	1,400	44	14,912
Massachusetts	Bristol County	36,687	4,258	3,714	1,783	64	12,849
New Jersey	Gloucester County	24,435	3,105	5,387	1,284	56	10,471
Maryland	Baltimore County	64,528	7,264	9,323	2,943	1,141	19,890
Virginia	Norfolk County	16,910	3,678	1,616	740	100	4,505

Source. USEPA 2023a

Notes:

CO = carbon monoxide, NO_X = oxides of nitrogen, O_3 = ozone, $PM_{2.5}$ = particulate matter less than 2.5 microns, PM_{10} = particulate matter less than 10 microns, SO_2 = sulfur dioxide, VOCs = volatile organic compounds

The USEPA classifies individual counties as *in attainment*, *nonattainment*, *maintenance*, or *unclassified* for each criteria air pollutant (USEPA 2021b). An area is *in attainment* if it meets the NAAQS for the criteria pollutant. An area is in *nonattainment* if it does not meet the NAAQS. If a county is in nonattainment, the state must develop a State Implementation Plan to attain and maintain the NAAQS. A *maintenance* area is one that recently became *in attainment* and must continue to demonstrate the preservation of the standard before the county can be redesignated as *in attainment*. An area is *unclassified* if there is insufficient information to determine the attainment status; these areas are typically treated as *in attainment* areas.

The CAA prohibits federal agencies from approving any activity that does not conform to a State Implementation Plan. This prohibition applies only with respect to *nonattainment* or *maintenance* areas. Conformity to a State Implementation Plan means conformity to a State Implementation Plan's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of such standards. The activities for which BOEM has authority are outside of any *nonattainment* or *maintenance* area, and therefore, not subject to the requirement to show conformity.

The CAA provides additional air quality and visibility protection to Class I areas which are national parks larger than 6,000 acres (ac; 24.3 square kilometers [km^2]) and national wilderness areas larger than 5,000 ac (20.2 km^2) (NPS 2018). There are no Class I areas within the GAA. The closest Class 1 area to the proposed Project Area is the Lye Brook Wilderness in Vermont which is approximately 160 mi (270 km) to the north (USEPA 2022c). The Fire Island National Seashore is a Class II area located approximately 100 mi (160 km) to the west of the SRWF. This means that some air pollution is permitted as long as the NAAQS or the maximum allowable increases over baseline concentrations are not exceeded (NPS 2020).

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases, such as chlorofluorocarbons, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride (SF_6). The largest source of GHGs is fossil fuel combustion (USEPA 2021c). CO_2 is the dominant GHG emitted in the United States from human activities. CO_2 is stable in the atmosphere and remains long enough (decades) to become well-mixed throughout the global atmosphere. SF_6 is an electrical insulator used in high-voltage equipment (USEPA 2021d) and to insulate switchgears on the offshore converter station (OCS-DC) and onshore converter station (OnCS-DC). GHG emissions are typically reported in carbon dioxide equivalents (CO_2e) which considers the different global warming potentials of the various GHGs (USEPA 2021e).

There are no federal air quality or emission standards for GHGs. Individual states have developed GHG reduction plans to mitigate the impacts of climate change (e.g., Commonwealth of Massachusetts 2022a; NYS 2022; NJ DEP 2022a). These plans include mandates to decrease GHG emissions through various methods, including improving energy efficiency, energy conservation, and increasing renewable energy sources to reduce GHG emissions to a baseline level (e.g., 1990). Individual states track and

report their GHG emissions to measure progress toward the goals. Recent statewide GHG emissions (provided as CO_2e) are provided in Table 3.4-2.

The CAA Section 328 directs the USEPA to regulate air pollution from Outer Continental Shelf (OCS) sources located offshore of states along the Pacific, Arctic, and Atlantic coasts. OCS air regulations (40 *CFR* Part 55) establish air pollution control requirements for permitting, monitoring, fees, compliance, and enforcement for OCS sources subject to the CAA and beyond state seaward boundaries (USEPA 2021f). OCS sources include emissions from construction, installation, operations and maintenance (O&M), and decommissioning within a 25-mi (40.2-km) radius of the centroid of the wind farm. OCS sources that may produce air emissions include vessels only when they are temporarily or permanently attached to the seabed and used for exploring, developing, or producing resources therefrom or physically attached to an OCS facility (40 *CFR* Part 55).

If the estimated emissions from construction of the OCS sources exceed the major source permitting thresholds for NO_x, VOCs, or one or more of the criteria pollutants, then the source would require a major source permit under the Nonattainment New Source Review (NNSR) and/or Prevention of Significant Deterioration (PSD) regulations. NNSR regulations require the lowest achievable emission rate, emission offsets, and public involvement (USEPA 2021g). These regulations apply to sources with the potential to emit 50 tons (45.4 metric tons) per year or more of VOCs or 100 tons (90.7 metric tons) per year or more of NO_x (COP Appendix K; AKRF 2021). PSD regulations require installation of best available control technology (BACT), an air quality analysis, an additional impacts analysis, and public involvement (USEPA 2021h). PSD regulations apply to sources that may emit 250 tons (226.8 metric tons) per year or more of any pollutant. Sunrise Wind submitted an OCS air permit application in August 2022 and the application was deemed complete in March 2023.

Facilities located within 25 nm (28.77 mi; 46.3 km) of a state seaward boundary are required to comply with the air quality controls of the nearest or corresponding onshore area (COA). The permitting authority for the OCS air permit is the COA for an OCS source. The nearest onshore area is typically the COA unless the USEPA designates another area (COP Appendix K; AKRF 2021). The nearest onshore area is Dukes County, Massachusetts; emissions that may occur nearest to Dukes County would be included in the OCS air permit.

3.4.2 Impact Level Definitions for Air Quality

This Final EIS uses a four-level classification scheme to analyze potential impact levels on air quality from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.4-4 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for air quality. Table G-3 in Appendix G (*Impact-Producing Factor* [IPF] *Tables*) identifies potential IPFs, issues, and indicators to assess impacts to air quality.

Table 3.4-4. Definition of Potential Adverse and Beneficial Impact Levels for Air Quality

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	Increases in ambient pollutant concentrations due to Project emissions would not be detectable.	Decreases in ambient pollutant concentrations due to Project emissions would not be detectable.
Minor to Moderate	Increases in ambient pollutant concentrations due to project emissions would be detectable but would not lead to exceedance of the NAAQS.	Decreases in ambient pollutant concentrations due to Project emissions would be detectable.
Major	Changes in ambient pollutant concentrations due to Project emissions would lead to exceedance of the NAAQS.	Decreases in ambient pollutant concentrations due to Project emissions would be larger than for minor to moderate impacts.

3.4.3 Impacts of Alternative A - No Action on Air Quality

When analyzing the impacts of the No Action Alternative on air quality, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities, on the baseline conditions for air quality. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.4.3.1 Impacts of the No Action Alternative

Under Alternative A, baseline air quality conditions would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore wind and offshore wind activities. Ongoing activities that could impact air quality in the GAA are continued operation and development of fossil fuel electricity generation facilities, onshore and offshore development, onshore and marine transportation, other commercial and industrial activities, construction of undersea transmission lines or gas pipelines, marine mineral use and dredged material disposal, and military use. Air or HAP emissions from these activities could cause short-term exceedances of air quality standards.

Ongoing offshore wind activities within the GAA that contribute to impacts on air quality include:

- Continued O&M of the Block Island Project (5 WTGs) installed in state waters;
- Continued O&M of the Coastal Virginia Offshore Wind (CVOW) project (2 WTGs) installed in OCS-A 0497, and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of the Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Forks projects would affect air quality through the primary IPFs of air emissions, climate

change, and accidental releases. Ongoing offshore wind activities would have the same type of impacts from air emissions, climate change, and accidental releases that are described in the following section for planned offshore wind activities, but the impacts would be of lower intensity.

3.4.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Other planned non-offshore wind activities that could impact air quality in the GAA are the continued operation and development of fossil fuel electricity generation facilities, onshore and offshore development, onshore and marine transportation, commercial and industrial activities, construction of undersea transmission lines or gas pipelines, marine mineral use and dredged material disposal, and military use. These activities may result in short-term increases in air, GHG, or HAP emissions which may cause short-term, localized exceedances of air quality standards.

The sections below summarize the potential impacts of planned offshore wind activities on air quality during construction, O&M, and decommissioning of the projects. The GAA of the Revolution Wind, New England Wind, South Coast Wind, and the Bacon Wind 1 Projects overlap with the GAA of the Proposed Action. BOEM anticipates future offshore wind activities to affect air quality through the following primary IPFs.

Air emissions: The potential emission sources from future offshore wind activities would include fossil-fuel combustion in main and auxiliary engines on marine vessels, helicopters, on-vessel equipment, construction vehicles and equipment, and fugitive dust emissions. Most emissions would occur during the construction phase of planned projects. Air emission impacts on air quality would be higher if the construction of multiple projects overlapped spatially or temporally. All projects would be required to comply with the CAA.

Future offshore wind activities other than the Proposed Action that may result in air emissions within the Massachusetts/Rhode Island (MA/RI) Lease Area include New England Wind, South Coast Wind, Revolution Wind, Beacon Wind, Vineyard Northeast Wind, and Bay State Wind. The total number of wind turbine that may be constructed in the MA/RI Lease Area by 2030 (not including the Proposed Action) is 1,068 WTGs which would produce up to approximately 15,000 megawatts (MW) of renewable energy. The total offshore construction phase emissions of criteria pollutants from future offshore wind projects through 2030 are estimated to be 30,217 tons CO; 143,994 tons NO_x; 2,750 tons SO_2, 3,757 tons VOC; 6,477 tons PM_{10}; and 4,421 tons $PM_{2.5}$. The Revolution Wind, New England Wind, South Coast Wind, and Beacon Wind 1 Projects are expected to have overlapping construction schedules with the Proposed Action in 2024 and 2025. The magnitude of emissions and resulting impacts would vary spatially and temporally during the construction phase. BOEM anticipates that air emission impacts on air quality would be minor to moderate.

Air emissions from O&M activities may overlap temporally, but overall, would be intermittent and dispersed and contribute to localized impacts on air quality; emissions during O&M would be less than during the construction and decommissioning phases. Estimated offshore O&M phase emissions through 2030 are 771 tons CO; 3,058 tons NO_x; 45 tons SO_2; 69 tons VOCs; 117 tons PM_{10}; and 109 tons $PM_{2.5}$. Emissions could result from routine or non-routine maintenance activities and repairs involving marine vessels carrying crew and materials, on-vessel equipment, and emergency diesel generators. Overall, operation of planned offshore wind projects would produce negligible emissions because wind turbines do not emit pollutants.

Offshore wind energy development could help offset emissions from fossil fuels, potentially improving regional air quality, reducing GHGs, and providing health benefits. An analysis by Katzenstein and Apt (2009), for example, estimates that CO_2 emissions can be reduced by up to 80 percent and NO_X emissions can be reduced up to 50 percent by implementing wind energy projects. An analysis by Barthelmie and Pryor (2021) calculated that, depending on global trends in GHG emissions and the amount of wind energy expansion, development of wind energy could reduce predicted increases in global surface temperature by 0.5–1.4 degrees Fahrenheit (°F; 0.3–0.8 degrees Celsius [°C]) by 2100. Overall, the development of the Revolution Wind, New England Wind, South Coast Wind, and the Bacon Wind 1 Projects would have minor beneficial impacts.

Climate change: Future offshore wind activities would produce GHG emissions that would minimally impact climate change compared to total global and United States GHG emissions. Fossil-fuel combustion during construction and decommissioning (e.g., from marine vessels and on-vessel equipment, construction equipment, construction vehicles) and during O&M (e.g., from marine vessels carrying crew, construction, and passenger vehicles) would produce CO_2 emissions. The estimated offshore CO_2e emissions from the construction and O&M activities of future offshore wind projects in the MA/RI Lease Area through 2030 are 9,138,691 tons and 751,649 tons, respectively. The development of future offshore wind projects would likely result in reduced regional GHG emissions because the emissions from fossil-fuel combustion would be displaced. Further, the reduced emissions would likely more than offset the small amount of GHG emissions from the future offshore wind activities. Future offshore wind activities would have an overall beneficial impact on climate change and would be an important component of state climate change mitigation plans.

Accidental releases: Accidental chemical spills during construction, O&M, and decommissioning could cause emission of HAPs; accidental releases would be more likely during the construction phase because of the increased vessel traffic and equipment use. Emissions of hazardous VOCs would occur through evaporation. HAPs are generally short-lived in the atmosphere and would cause short-term, localized air quality impacts. Accidental releases would occur infrequently over the lifetime of future offshore wind projects and have minor impacts.

3.4.3.3 Conclusions

Impacts of the No Action Alternative

Under Alternative A, the No Action Alternative, air quality would continue to be affected by existing environmental trends and ongoing activities. Air quality patterns would continue to follow the regional trends and respond to societal, economic, technological, and environmental activities. Non-offshore wind activities may have air quality impacts due to the construction and O&M of new energy generation facilities needed to meet future energy needs or from the maintenance of fossil fuel energy facilities already in service. Ongoing non-offshore and offshore wind activities could cause localized, short-term increases in air, GHG, or HAP emissions, and short-term exceedances of air quality standards. The No Action Alternative would result in **minor** to **moderate** adverse impacts on air quality from air emissions, climate change, and accidental releases and a **minor** to **moderate beneficial** impact due to reduction of fossil fuel emissions.

Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, existing environmental trends and ongoing activities would continue. Planned non-offshore wind activities and offshore wind activities would contribute to impacts on air quality through air and GHG emissions and accidental releases, particularly during the construction phase of projects. Air emission and accidental release cumulative impacts would be **minor** to **moderate** depending on the extent and duration of emissions or releases. Planned activities would produce GHG emissions that would have a **minor** to **moderate** adverse impact on climate change compared to fossil-fuel powered energy generation. As more offshore wind projects come online, the need for fossil fuel power generation would decrease. This would contribute to improved air quality from the larger amount of renewable energy sources and reduced air emissions. Overall, planned offshore wind activities would have an indirect **minor** to **moderate beneficial** cumulative impact on air quality after the offshore wind projects are operational.

3.4.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the Project Design Envelope (PDE) would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on air quality:

- The number of WTGs and number of foundations;
- Length of the inter-array cable (IAC), offshore export cables, and onshore export cable;
- The number of marine vessels, helicopters, construction, and passenger vehicles used during construction, O&M, and decommissioning, and number of trips per vessel;
- Engine and fuel types used in marine vessels, equipment, and construction vehicles;
- The travel routes to and from the offshore and onshore components;

- Air emission ratings of marine vessel, construction equipment, and vehicle engines; and
- Soil characteristics at onshore areas.

3.4.5 Impacts of Alternative B - Proposed Action on Air Quality

The sections below summarize the potential impacts of the Proposed Action on air quality during the various phases of the Proposed Action. Routine activities would include construction, O&M, and decommissioning of the Project, as described in Chapter 2, Section 2.1.2 *Alternative B – Proposed Action.* Construction, O&M, and decommissioning activities associated with the Proposed Action have the potential to cause both direct and indirect impacts on air quality through the IPFs of emissions, climate change, and accidental releases.

3.4.5.1 Construction and Installation

3.4.5.1.1 Onshore Activities and Facilities

Air emissions: Air emissions from the Proposed Action could affect six counties in nonattainment with one or more criteria pollutants. The attainment status of an area is provided in the USEPA Green Book (USEPA 2021i). Albany County, New York[1]; Bristol County, Massachusetts; Providence County and Washington County, Rhode Island; and Norfolk County, Virginia are in attainment for all criteria air pollutants. Kings County, New York is in nonattainment with O_3 and is a maintenance area for CO and $PM_{2.5}$. Suffolk County, New York is in moderate nonattainment with O_3 and maintenance for $PM_{2.5}$. New London County, Connecticut, is in nonattainment of the O_3 standard and is the only port currently planned to be used during the construction phase that is in a nonattainment area (CT DEEP 2016; USEPA 2021i). Dukes County, Massachusetts, is in nonattainment with the 2008 O_3 standard but is in attainment with the 2015 standard (Commonwealth of Massachusetts 2022b; USEPA 2021i). Baltimore County, Maryland, is in nonattainment with the O_3 and SO_2 standards and is a maintenance area for CO. Gloucester County, New Jersey, is in nonattainment with the O_3 standard (NJ DEP 2022b).

Air emissions may occur from fuel combustion in heavy equipment and construction vehicles during construction and installation of the onshore transmission cable, onshore interconnection cable, and the OnCS-DC. Construction of the onshore transmission cable and onshore interconnection cable would involve site preparation, clearing and grading, trench excavation, duct bank and vault installation, cable installation and jointing, testing, and restoration (COP Section 3.3.2.3, Sunrise Wind 2023). Construction of the OnCS-DC would involve clearing and grading, foundation and equipment installation, site restoration, and commissioning (COP Section 3.3.1.2, Sunrise Wind 2023). A variety of on-road and non-road engines would be used during the onshore construction phase including excavators, drills, backhoes, bulldozers, cranes, tractors, cable puller, pumps, compressors, and passenger vehicles (COP

[1] The Port of Albany and the Port of Coeymans are in the former Albany-Schenectady-Troy Area, New York Ozone Nonattainment Area for the 1979 and 1997 NAAQS. However, USEPA has revoked these standards.

Appendix K, AKRF 2021). The onshore construction and installation phase is expected to last 2 years; emissions would cease when construction is complete.

Estimated onshore construction emissions and emissions within 3 nm of the state borders for the Proposed Action are provided in Table 3.4-5; these emissions are less than county level emissions (Table 3.4-3). While the activities for which BOEM has authority are outside of any nonattainment or maintenance area, and therefore, not subject to the requirement to show conformity, for the purpose of evaluating potential effects on air quality of the Proposed Action, the estimated emissions were compared to de minimus threshold values. For a moderate O_3 nonattainment area, the VOC de minimus value is 50 tons/year and for NO_x is 100 tons/year (USEPA 2023c). Onshore VOC emissions (Table 3.4-5) are estimated to be below the threshold for all states and proposed ports. Total onshore NO_x emissions and emissions within 3 nm of state borders are estimated to be above 100 tons/year in New York, Rhode Island, and Maryland. These emissions reflect the sum of all emissions from the various ports proposed in New York and Rhode Island; the emissions from individual proposed ports are less than shown in Table 3.4-5. Only the Port of Albany in New York, the Ports of Providence and Davisville/Quonset Point in Rhode Island, and Sparrows Point in Maryland may have emissions exceeding the de minimus threshold. Considering that these ports may only be used during specific activities and that emissions would be dispersed over time, it is unlikely that emissions from any individual port would cause nonattainment with NAAQS. Overall, these emissions would be temporary, dispersed over the entire construction phase, minimized through mitigation, and much less than county emissions in 2020 (Table 3.4-3).

Site preparation, clearing, grading, and vehicle use may produce fugitive dust emissions (i.e., PM_{10} or $PM_{2.5}$); the magnitude of emissions would depend on the spatial extent of the activities and on the soil type and moisture content. Fugitive dust emissions would be minimized through the Dust Control Plan (AQ-05) and Stormwater Pollution Prevention Plan (SWPPP).

Sunrise Wind would implement environmental protection measures (EPMs; see Applicant Proposed Measure [APM] AQ-01, AQ-02, AQ-03, AQ-04, AQ-05, AQ-06, and AQ-07, listed in Table H-1, Appendix H) to reduce or avoid air emissions during onshore construction and installation activities. These measures include using engines, fuels, and equipment that meet applicable air emissions standards and dust control. Onshore air emissions would be greatest during the construction phase and would be offset by the potential reduction in fossil fuel emissions. Air emissions would be intermittent throughout the 2-year construction phase and would have a minor to moderate impact on air quality.

Table 3.4-5. Estimated Onshore Construction Emissions and Emissions within 3 Nautical Miles of State Borders (tons per year) during the Construction Phase of the Proposed Action

Emission Location	CO	NO_x	VOCs	$PM_{2.5}$	PM_{10}	SO_2
Onshore and within 3 nm of New York	123.9	348.2	7.8	6.6	5.7	1.2
Onshore and within 3 nm of Rhode Island	206	496	11.6	9.1	9.2	0.5

Emission Location	CO	NO_x	VOCs	$PM_{2.5}$	PM_{10}	SO_2
Onshore and within 3 nm of Connecticut	4.0	9.7	0.2	0.2	0.2	0
Onshore and within 3 nm of Massachusetts	3.8	9.3	0.2	0.2	0.2	0
Onshore and within 3 nm of New Jersey	25.6	61.6	1.4	1.1	1.1	0.1
Onshore and within 3 nm of Maryland	276.1	664.6	15.6	12.2	12.2	0.7
Onshore and within 3 nm of Virginia	4.3	10.3	0.2	0.2	0.2	0

Source: Adapted from Table A3 in COP Appendix K, AKRF 2021.

Notes:

CO = carbon monoxide, NO_x = oxides of nitrogen, VOCs = volatile organic compounds, $PM_{2.5}$ = particulate matter less than 2.5 microns, PM_{10} = particulate matter less than 10 microns, SO_2 = sulfur dioxide, nm = nautical miles

Climate change: GHG emissions would occur throughout the onshore construction phase; however, they would be small compared to total annual statewide emissions. CO_2e emissions were estimated to range from 1,074 tons per year (tpy) (974.3 metric tpy) for emissions within 3 nm (3.45 mi; 5.6 km) of Connecticut, to 32,893 tpy (29,840 metric tpy) for emissions within 3 nm of New York, to 73,202 tpy (66,407.7 metric tpy) for emissions within 3 nm (3.45 mi; 5.6 km) of Maryland (COP Appendix K, AKRF 2021). These totals are well below the total CO_2e emissions from fossil-fuel combustion in the United States transportation sector (1,817 MMT CO_2e) or the electricity generation sector (1,602 MMT CO_2e) in 2019 (USEPA 2021k) and from the most recently reported statewide CO_2e emissions (Table 3.4-2). The GHG emissions from the Proposed Action would be offset by the reduction in emissions from the closure or reduced operations of fossil-fueled electricity generating facilities. Overall, it is anticipated that the Proposed Action would have a beneficial impact on GHG emissions and air quality compared to the GHG emissions that would be produced by generation of the same amount of energy from a fossil-fueled generation facility.

Accidental releases: Evaporative emissions of HAPs from accidental chemical spills or releases could occur during the onshore construction of the proposed Project. Coolants, oils, fuels, solvents, and lubricants would be used at the OnCS-DC; an estimated maximum of mineral oils is 101,333 gallons (gal) (383,587 liters [L]) (COP Table 3.3.1-2, Sunrise Wind 2023). These materials, as well as hydraulic fluids, would be used during trenchless and duct bank installation, and installation of the onshore transmission cable and onshore interconnection cable. There is a higher risk of accidental releases during the construction phase than O&M because of the increased amount of construction vehicles and equipment. Accidental HAP emissions would be short-term and localized to the area at or around the release. Accidental releases would be avoided or reduced through the development and implementation of the Environmental Management and Construction Plan (EM&CP), which includes an SWPPP, Spill, Prevention, Control, and Countermeasure (SPCC) Plan, and Oil Spill Response Plan (OSRP) (APM GEN-20, APM GEN-21). Any spills would be governed by state of New York regulations and secondary oil containment procedures following industry standards.

3.4.5.1.2 Offshore Activities and Facilities

Air emissions: During construction of the SRWF, the main sources of air emissions would be from fossil-fuel combustion emissions on helicopters; marine vessels; on-vessel equipment (e.g., compressors); onboard engines including generators; heavy equipment during construction and installation of the foundations, WTG, OCS-DC; construction and cable-laying equipment for the IAC, SRWEC-OCS, and SWREC-NYS; generators on the WTGs and OCS-DC; and vessels traveling to and from the OCS sources when within 25 mi (40.2 km). During the construction phase, there would be increased combustion emissions from increased vessel traffic, air traffic, and construction equipment. The air pollutants that could be emitted include criteria pollutants, HAPs, and VOCs. The specific emissions and amounts would vary throughout the construction phase. Diesel generators would be used to provide temporary power during construction and commissioning of the WTGs which is expected to be completed in less than 1 year. The total offshore construction phase is anticipated to last from 1 year to 18 months. The offshore emissions would be short-term and would cease after construction is complete.

During construction of the SRWEC-OCS, air emissions may arise from vessels burning fossil fuels that are used to transport crew and material and to perform or support laying of the SRWEC and horizontal directional drilling (HDD) installation at landfall. This includes vessels attached to or erected on the seafloor and conducting cable laying within 25 mi (40.2 km) of the OCS source centroid. Air emissions from construction of the SRWEC would be short-term and would stop after construction is complete.

During construction and installation of the SRWEC-NYS, air emissions may come from offshore vessels transiting through state waters, on-vessel equipment, portable diesel generators, or onshore-equipment. The SRWEC construction and installation phase is expected to last approximately 8-months. These emissions would cease when construction of the SRWEC-NYS is complete.

The estimated offshore construction and installation emissions subject to the OCS permit (i.e., within 25 mi [40.2 km] of the SRWF and SRWEC centroids) were compared to emission standards for the COA in Dukes County, Massachusetts. The Massachusetts State Implementation Plan defines the NO_x and VOC emission threshold as 50 tpy (45.4 metric tpy) (MA DEP 2018). Based on the emission estimates for the OCS air permit, the total estimated VOCs emissions (163 tpy [147.9 metric tpy]) from construction emissions of the SRWF (137.8 tpy [125 metric tpy]), SRWEC (7.2 tpy [6.5 metric tpy]) and from crew transport and support (18.0 tpy [16.3 metric tpy]) would exceed the 50 tpy (45.4 metric tpy) threshold (AKRF, 2023a). The total NO_x emissions (3,090.8 tpy [2,803.9 metric tpy]) from construction of the SRWF (2,438.9 tpy [2,212.5 metric tpy]), SRWEC (222.9 tpy [202.2 metric tpy]) and from crew transport and support (426.5 tpy [386.9 metric tpy]) would also exceed the threshold. Most emissions would occur during foundation installation. The offshore VOC and NO_x construction emissions would be short-term, vary spatially, occur throughout the 12-to-18-month construction phase, be permitted under the OCS air permit, and would have a minor to moderate impact on air quality.

SRW submitted an OCS air permit application in February 2023, which included separate reports titled “Sunrise Wind Offshore Coastal Dispersion Air Quality Impact Analysis Report” and the “Sunrise Wind

Class 1 Air Quality and Visibility Impact Analysis Report (AKRF 2023a, 2023b). The application discussed the methods and results of several air quality analyses including emission estimates, air dispersion modeling to demonstrate compliance with the NAAQS, comparisons of estimated potential emissions from the OCS source to PSD and NNSR thresholds, an air quality related value (AQRV) analysis in the Lye Brook Wilderness Class 1 Area, and a visibility analysis.

PSD regulations require that an air quality impact analysis be performed for each pollutant that the Project would emit in a significant quantity to make sure that the Project would not contribute to an exceedance of the NAAQS or an applicable PSD increment. The maximum running 12-month emissions for the worst annual period during construction of the OCS source were estimated to exceed the PSD thresholds for NO_2, CO, PM_{10}, $PM_{2.5}$, SO_2, and VOC and the NNSR thresholds for NO_x and VOC; these results trigger PSD and NNSR permitting and BACT and lowest achievable emission rate analyses. The application is currently under review and emissions from the OCS source would be permitted as part of the OCS air permit.

AQRVs are resources that are sensitive to air quality, such as lakes, rivers, soil, vegetation, fish, wildlife, and visibility; the AQRV of concern to the Lye Brook Wilderness is visibility (USFS, NPS, USFWS 2010; AKRF 2023b). The effect of the Project on natural visibility was assessed by simulating the SRWF's effect on light extinction. The threshold used for light extinction caused by sources over 50 km from the Class I area was a less than 5 percent change in light extinction based on the 98^{th} percentile change in light extinction of each modeled year (2018, 2019, 2020) (USFS, NPS, USFWS 2010). As part of the AQRV analysis, the Project must demonstrate that significant visibility degradation would not occur as a result of increased haze or plumes.

SRW used a combination of offshore and coastal dispersion modeling and the USEPA CALPUFF modeling system for the dispersion modeling and the Class 1 SIL and visibility analyses. Modeling was completed for PM_{10}, $PM_{2.5}$, SO_2, and NO_2, and the impacts for each pollutant were compared to their respective Class 1 SILs. The predicted maximum concentrations for each pollutant were less than their respective SILs suggesting that the Project's impacts would not cause or contribute to an exceedance of the NAAQS and an additional PSD Increment analysis was not needed. The 98^{th} percentile change in light extinction did not exceed 5 percent for any year modeled, thus the Project is not anticipated to have an adverse impact on visibility in the Lye Brook Wilderness Class 1 area.

Sunrise Wind would implement EPMs to reduce or avoid air emissions during offshore activities as described in Section 4.3.4.3 of the COP (APM AQ-01, AQ-02, AQ-03, AQ-05, AQ-06, AQ-07, Sunrise Wind 2023) at a minimum and would comply with the OCS air permit. These measures include using low sulfur diesel in generators on the WTGs or OCS-DC; low sulfur fuel, marine distillate, or marine residual fuels on vessels; engines that meet applicable air emissions standards to satisfy BACT and lowest achievable emission rate requirements; dust control; and obtaining emission reduction credits if required by the OCS permit.

Climate change: GHG emissions would occur during the construction and installation of the offshore components of the proposed Project. The total CO_2e emissions were estimated to be 328,401 tpy (297,920 metric tpy) with 244,527 tpy (221,831 metric tpy) from construction of the SRWF; 17,839 tpy (16,183 metric tpy) due to construction of the SRWEC; and 65,768 tpy (59,664 metric tpy) for crew transport and support (COP Appendix K; AKRF 2021). These emissions would be much less than the total annual statewide emissions (Table 3.4-2).

The proposed Project would use SF_6 insulated switchgears on the OCS-DC. These switchgears are designed to be completely sealed; thus, little to no SF_6 emissions are expected. Low pressure detectors would be installed to detect any SF_6 leaks (APM AQ-07, COP Section 4.3.4.3. Sunrise Wind 2023). SRW performed a BACT assessment for the OCS air permit application that considered the use of SF_6-free equipment. The assessment considered the technology currently available, and its feasibility given the design and high voltage requirement of the OCS-DC, available space on the OCS-DC, how widely available other equipment is, and the cost effectiveness of altering the Project design. It was determined that using SF_6-free switchgears was not technically feasible at this time based on the electrical requirements of the OCS-DC (60 hertz [Hz]-rated components).

Accidental releases: Accidental chemical spills or releases during construction of the offshore components of the proposed Project could result in HAP emissions. Oils, solvents, lubricants, and fuels would be used at the OCS-DC in transformers and reactors, fuel tanks, cranes, rotating equipment, pumps, generators, and chilling/cooling units. HAP emissions from accidental spills would be avoided or reduced through implementation of the EC&MP and OSRP (APM GEN-21). There would be a spill containment system on the OCS-DC designed with at least 110 percent of secondary containment for all oils, fuels, grease, and lubricants.

Each of the WTGs would require oils, fuels, and lubricants for the bearings, yaw pinions, accumulators, pumping unit, actuators, gearbox, transformer, emergency generator, and cooling system. Potential emissions of HAPs would be avoided or minimized through measures to contain accidental releases at the WTGs including 100 percent leakage-free joints, high pressure, and oil level sensors to detect leakages, and retention reservoirs that could contain 110 percent of the volume of any potential leaks (COP Section 3.3.8.1, Sunrise Wind 2023). Accidental HAP emissions would be short-term, intermittent, and localized to the area at or around the spill or leak and result in a minor to moderate impact on air quality.

3.4.5.2 Operations and Maintenance

3.4.5.2.1 Onshore Activities and Facilities

Air emissions: Air emissions would occur during periodic O&M of the OnCS-DC and cables from vehicle use to transport material and personnel and equipment use. Ports in New York and Rhode Island are being considered to support O&M activities. The estimated onshore emissions and emissions within 3 mi (4.8 km) of the New York and Rhode Island state boundaries are provided in Table 3.4-6. The estimated

air emissions during the O&M phase would be less than the potential emissions during the onshore construction and installation phase because there would be less workers, passenger and construction vehicles, and equipment used. The estimated NO_x and VOC emissions would be less than the de minimus thresholds for a moderate O_3 nonattainment area (i.e., Suffolk County, NY) and much less than county level emissions (Table 3.4-3). Air emissions would be minimized through implementation of measures described in Section 4.3.4.3 of the COP (APM AQ-01, AQ-02, AQ-03, AQ-04, AQ-05, AQ-06, AQ-07, Sunrise Wind 2023) at a minimum. Air quality impacts would be expected to occur close to the emission source and would be dispersed throughout the 25- to 35-year lifetime of the proposed Project. It is anticipated that the potential emissions from maintenance vehicles and equipment would decrease due to increases in fuel efficiency and standards over the Project lifetime. Onshore air emissions during O&M are expected to have a minor to moderate impact on air quality.

Table 3.4-6. Estimated Onshore Emissions and Emissions within 3 Nautical Miles of State Borders (in tons per year) during the O&M Phase of the Proposed Action

Emission Location	CO	NO_x	VOCs	$PM_{2.5}$	PM_{10}	SO_2
Onshore and within 3 nm of New York	23	54	1	1	1	0
Onshore and within 3 nm of Rhode Island	13	31	1	1	1	0

Source: Adapted from Table A4 in COP Appendix K, AKRF 2021.

Notes:

CO = carbon monoxide, NO_X = oxides of nitrogen, VOCs = volatile organic compounds, $PM_{2.5}$ = particulate matter less than 2.5 microns, PM_{10} = particulate matter less than 10 microns, SO_2 = sulfur dioxide, nm = nautical miles

Climate change: GHG emissions would occur during routine and non-routine O&M activities at the onshore facilities over the 25-to-35-year lifetime of the proposed Project. The estimated CO_2e emissions from O&M activities in New York are 6,001 tpy (5,444 metric tpy) and from activities in Rhode Island are 3,461 tpy (3,140 metric tpy). These emissions would be small compared to the total New York and Rhode Island statewide emissions. Over the lifetime of the Project, GHG emissions would likely decrease through improved technology and emissions standards.

The OnCS-DC would use SF_6 insulated switchgears for electrical insulation purposes. The maximum potential volume of SF_6 that may be used for the OnCS-DC is 3,500 pounds (COP Section 3.3.1.1; Sunrise Wind 2023). Fugitive SF_6 emissions may occur at a rate of 1 percent annually resulting in up to 0.020 tons/year (COP Section 4.3.4.2; Sunrise Wind 2023). The switchgears are designed to be completely sealed and would be expected to result in little to no SF_6 emissions. All SF_6 insulated switchgears would contain low pressure detectors in case a leak was to occur (APM AQ-07).

Accidental releases: Accidental chemical spills or leaks and subsequent HAP emissions could occur during onshore O&M activities. Operation of the OnCS-DC would require oils, lubricants, and fuels. Vehicles used to transport crew and equipment would use diesel fuel. Repair work on the onshore

interconnection cable could require the use of hydraulic fluids. Accidental releases would be prevented through implementation of the SPCC Plan and would be infrequent and dispersed throughout the 25-to 35-year lifetime of the proposed Project. Sunrise Wind would implement measures such as using low sulfur diesel, fueling offsite, and an Inadvertent Return Plan, Materials Management Plan, and an SPCC Plan, as part of the EM&CP, to minimize or eliminate accidental HAP emissions during onshore O&M activities (APM WQ-01, WQ-02, GEN-20, GEN-21, GEN-22).

3.4.5.2.2 Offshore Activities and Facilities

Air emissions: During the offshore O&M phase, air emissions could occur during periodic marine vessel or helicopter use to transport material and personnel to the SRWF, OCS-DC, SRWEC, or IAC for regular inspections and maintenance practices and from on-vessel equipment used for repairs or maintenance. Routine inspections of electrical components and minor corrective and preventative maintenance actions are anticipated to occur multiple times per year (COP Section 3.5.2; Sunrise Wind 2023). Annual maintenance activities would include above water and visual inspections, routine service and safety checks, and oil and high-voltage maintenance. Non-routine (e.g., corrective and major repairs) maintenance would occur as needed. It is possible that a WTG installation or cable-laying vessel could be used for repairs or maintenance over the operational life of the proposed Project; however, this would be infrequent.

The SRWF, SRWEC-OCS, or SRWEC-NYS would not emit any pollutants during operation. The temporary generators on the WTGs used during construction and commissioning would no longer be in place during the O&M phase. Emergency generators on the WTGs or OCS-DC would only operate during emergencies or testing; emissions would thus be infrequent and negligible.

A smaller number of vessels would be needed during the O&M phase compared to the construction phase. The total estimated emissions during O&M for the OCS permit are 39.6 tpy CO, 99.2 tpy NO_x, 3.7 tpy VOCs, 1.1 tpy SO_2, 1.6 tpy $PM_{2.5}$, and 1.7 tpy PM_{10} (35.9 metric tpy CO, 90 metric tpy NO_x, 3.4 metric tpy VOCs, 1.0 metric tpy SO_2, 1.45 metric tpy $PM_{2.5}$, and 1.5 metric tpy PM_{10}) (AKRF 2023a). The potential air emissions during the offshore O&M phase would be less than during the construction phase. Sunrise Wind submitted an OCS air permit application in August 2022 and a revised application in February 2023; air emissions from O&M activities would be permitted under the OCS air permit.

Offshore wind energy development would cause beneficial impacts by offsetting emissions from fossil fuel electricity generation, potentially improving regional air quality and reducing GHGs, and by providing health benefits. The minimum and maximum annual avoided emissions from operation of the proposed Project and the minimum and maximum estimated avoided emissions over a 25-year Project lifetime are provided in Table 3.4-7; the emissions were estimated using *Technical Documentation for the Offshore Wind Energy Facilities Emission Estimating Tool* (Chang et al. 2017). The proposed Project is anticipated to displace emissions of NO_x, SO_2, VOC, CO, GHG (CO_2, N_2O, CH_4), particulate matter, black carbon, and lead. These estimates were based on a minimum of 3,083,520 MW-hours generated per

year and a maximum of 3,854,400 MW-hours generated per year (COP Appendix K; AKRF 2021). The avoided emissions would have long-term minor to major beneficial impacts.

Table 3.4-7. Emissions Avoided by Operation of the Proposed Project (tons)

Avoided Emissions	NO_x	SO_2	CO	VOCs	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Minimum annual	1,380	1,227	1,380	85	270	377	2,074,241	68	9	2,078,554
Maximum annual	2,548	2,266	2,548	157	498	696	3,830,275	125	16	3,838,239
Minimum over 25 years	29,486	30,681	34,499	2,124	6,745	9,426	51,856,033	1,689	220	51,963,849
Maximum over 25 years	76,228	79,316	34,499	5,492	17,438	24,639	134,059,630	4,367	569	134,338,360

Source: AKRF 2023a

Notes:

NO_X = oxides of nitrogen, SO_2 = sulfur dioxide, CO = carbon monoxide, VOCs = volatile organic compounds, PM2.5 = particulate matter less than 2.5 microns, PM10 = particulate matter less than 10 microns, CO_2 = carbon dioxide, CH_4 = methane, N_2O = nitrous oxide, CO_2e = carbon dioxide equivalents

The potential health benefits of avoided emissions were evaluated using USEPA's CO-Benefits Risk Assessment (COBRA) health impacts screening and mapping tool (USEPA 2022d). This tool estimates the health and economic benefits of clean energy policies. The COBRA web edition was used to analyze the health impacts of avoided emissions using New York, Connecticut, Rhode Island, and Massachusetts as the states where emission changes would occur. The Fuel Combustion Electric Utility sector was selected as the sector where emission changes would occur. COBRA was run for two different avoided emission scenarios. One scenario used the maximum annual avoided emissions in NO_X (2,548 tons), SO_2 (2,266 tons), VOCs (157 tons), and $PM_{2.5}$ (696 tons) estimated for the Sunrise Wind Project for the OCS air permit (AKRF, 2023a). The other scenario used avoided emissions from the USEPA AVoided Emissions and geneRation Tool (AVERT) v4.0 model for NO_x (580 tons), SO_2 (130 tons), VOCs (70 tons), and $PM_{2.5}$ (160 tons) based on the Proposed Action (1,034 MW). COBRA estimates the total health benefit, which encompasses all saved costs of the avoided health events. COBRA includes a discount rate (3 percent or 7 percent) to express future economic values in present terms because not all health effects and associated economic values occur in the year of analysis; this accounts for the 'time value of money' (USEPA 2022d). The analysis was performed using both discount rates for both scenarios to provide a range of estimated health benefit costs. Using the avoided emissions estimated for the OCS air permit at the 3 percent discount rate, the estimated health benefits would range from $193,032,927 to $435,028,407, and at a 7 percent discount rate, the saved costs would range from $172,273,738 to $387,934,480. Using the avoided emissions based on the AVERT model, the estimated health benefits would range from $35,903,032 to $80,913,308 at a 3 percent discount rate and from $32,042,326 to $72,154,462 at a 7 percent discount rate. This would be a long-term minor beneficial impact.

Climate change: GHG emissions expected to occur during offshore O&M activities would contribute to climate change. The O&M CO_2e emissions are estimated to be 17,726 tpy (16,081 metric tpy) (AKRF 2023a). These estimated emissions would be much less than estimated for the construction phase (Table 3.4-2). The estimated O&M CO_2e emissions are approximately two orders of magnitude lower than the minimum estimated annual avoided CO_2e emissions (2,078,623 tons) (Table 3.4-7). Operation of the proposed Project would have a minor beneficial impact on climate change.

The OCS-DC would use SF_6 insulated switchgears for electrical insulation purposes. The maximum potential volume of SF_6 that may be used for the OCS-DC is 3,960 pounds (Table 3.3.6-1 in COP; Sunrise Wind 2023). A maximum of 0.020 tons/year of fugitive SF_6 emissions may occur during operation of the OCS-DC (COP Section 4.3.4.2; Sunrise Wind 2023). The switchgears are designed to be completely sealed and would be expected to result in little to no SF_6 emissions. All SF_6 insulated switchgears would contain low pressure detectors in case a leak was to occur (APM AQ-07).

Accidental releases: Accidental chemical spills or leaks and subsequent HAP emissions could occur during offshore O&M activities. Spill containment measures on the WTGs and OCS-DC and implementation of best management practices (BMPs) would minimize or eliminate accidental HAP emissions; however, minor HAP emission could occur from broken hoses, pipes, or fasteners (COP Section 4.2.5.1; Sunrise Wind 2023). Accidental releases would be infrequent and less likely to occur than during the construction phase.

3.4.5.3 Conceptual Decommissioning

3.4.5.3.1 Onshore Activities and Facilities

Air emissions: Impacts on air quality from onshore activities during the decommissioning phase would be similar to or of lesser intensity than during the construction and installation phase and would occur for a shorter period of time. Activities would include removing the onshore interconnection cable; however, the OnCS-DC and onshore transmission cable could be abandoned in place (COP Section 4.2.1.3; Sunrise Wind 2023). The potential emissions (e.g., CO, NO_x, VOCs, $PM_{2.5}$, PM_{10}) and sources (e.g., fossil-fuel combustion in construction vehicles and equipment) would be similar to those described for the construction phase. Air emissions from decommissioning were not estimated but are expected to be less than during the construction phase because some facilities may be left in place and because of improved emission control technology and more stringent emission standards 25-35 years in the future. Decommissioning activities would occur in accordance with requirements and permits at that time and with the decommissioning plan. Air emissions would be short-term. Decommissioning would have a minor to moderate impact on air quality.

Climate change: GHG emissions from decommissioning were not estimated but are expected to be less than during the construction phase because some facilities may be left in place and because of improved emission control technology and more stringent emission standards 25-35 years in the future. Decommissioning activities would occur in accordance with requirements and permits at that time and

with the decommissioning plan. GHG emissions would be short-term. Decommissioning would have a minor to moderate impact on air quality.

Accidental releases: HAP emissions from accidental chemical spills or leaks during decommissioning may occur infrequently. Emissions would be short-term and would occur at the source. Accidental releases would be minimized or avoided through implementation of BMPs and would have a minor to moderate impact on air quality.

3.4.5.3.2 Offshore Activities and Facilities

Air emissions: Activities during the decommissioning phase would be similar to the construction and installation phase but would occur for a shorter period. Activities would include removing the structure and foundations of the SRWF, OCS-DC, and SRWEC. There would be a short-term increase in marine vessel and helicopter traffic. It is expected that similar equipment would be used as during construction, but air emissions are expected to be less because of improved emission control technology and more stringent emission standards 25-35 years in the future. Decommissioning is expected to be completed within 2 years and any emissions would cease after decommissioning is complete. Decommissioning would occur in accordance with requirements and permits at that time and would have a minor to moderate impact on air quality.

Climate change: Offshore activities during the decommissioning phase would be similar to the construction and installation phase. There would be a short-term increase in marine vessel and helicopter traffic. It is expected that similar equipment would be used as during construction, but GHG emissions are expected to be less because of improved emission control technology and more stringent emission standards 25-35 years in the future. Decommissioning is expected to be completed within 2 years and any emissions would cease after decommissioning is complete.

Accidental releases: HAP emissions from accidental chemical spills or leaks during decommissioning could occur infrequently. Emissions would be short-term and would occur at the source. Accidental releases would be minimized or avoided through implementation of BMPs and would have a minor to moderate impact on air quality.

3.4.5.4 Cumulative Impact of the Proposed Action

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned wind activities.

Air emissions: Onshore and offshore air emissions during construction and installation of the Proposed Action would contribute a noticeable increment to cumulative impacts on air quality. Planned offshore wind construction activities in the MA/RI Lease Area, including the Proposed Action, are estimated to emit 146,087 tons of NO_x; 3,806 tons of VOC; 31,086 tons CO; 6,516 tons PM_{10}; 4,460 tons $PM_{2.5}$; and 2,752 tons of SO_2 (Appendix E); construction emissions associated with the Proposed Action would

contribute approximately 1 to 3 percent of the total construction-related emissions through 2030. Emissions from the Proposed Action would be greater than or less than those from other offshore wind projects depending on the project size. The main driver for the impact ratings are combustion emissions from marine vessel, air, and vehicle traffic; construction equipment; and fugitive dust emissions. Emissions would be higher during overlapping activities from ongoing and planned projects but would be short-term, highly variable, and cover large geographic areas and would have a minor to moderate impact on air quality.

Onshore and offshore air emissions during O&M and decommissioning activities would contribute a noticeable increment to cumulative impacts. Planned O&M activities, including the Proposed Action, in the MA/RI Lease Area are estimated to emit 3,241 tons of NO_x; 73.4 tons of VOC; 848 tons CO; 121 tons PM_{10}; 112 tons $PM_{2.5}$; and 45 tons of SO_2 (Appendix E); the Proposed Action would contribute approximately 1 to 9 percent of the total emissions. O&M emissions from the Proposed Action would be greater than or less than those from other offshore wind projects depending on the project size. Overall, cumulative impacts of the Proposed Action associated with O&M activities would be intermittent and widely dispersed and have a minor to moderate impact on air quality. The cumulative avoided emissions resulting from operation of the proposed Project along with other planned offshore wind projects would have a minor to major benefit on air quality. An overall improvement in air quality on a regional scale is expected as fossil-fueled emissions are reduced.

The decommissioning process for all offshore wind projects is expected to be similar to that for SRWF, and air emission impacts would be similar to those of SRWF. Air quality impacts could be greater if decommissioning activities overlap in time. The cumulative impacts of air emissions during decommissioning of the proposed Project would have a minor to moderate impact on air quality.

Climate change: The cumulative impacts of onshore and offshore GHG emissions during construction and installation, O&M, and decommissioning of the Proposed Action would contribute a noticeable increment to cumulative impacts on air quality. Planned construction activities in the MA/RI Lease Area through 2030 are estimated to emit approximately 9,369,195 tons CO_2e of which approximately 3 percent would be contributed by the Proposed Action. The Proposed Action is estimated to contribute approximately 3 percent of the total 771,891 tons CO_2e due to planned cumulative O&M activities. The cumulative impact of GHG emissions would have a minor to moderate impact on air quality. The net decrease in GHG emissions due to increased energy generation from offshore wind projects, including the Proposed Action, would have a cumulative beneficial impact on air quality.

Accidental releases: The Proposed Action would contribute a negligible to noticeable increment to the cumulative accidental release impacts on air quality. Accidental releases would occur infrequently over the 25- to 35-year lifetime of offshore wind projects and would be short-term and localized. The cumulative accidental release impacts during construction, O&M, and decommissioning activities would have a negligible to moderate impact on air quality.

3.4.5.5 Conclusions

Impacts of the Proposed Action

Air emissions, GHG emissions, and accidental releases would each have a **minor** to **moderate** short-term impact on air quality but would be dispersed throughout the construction, O&M, or decommissioning phases of the proposed Project. More air quality impacts from air emissions, GHG emissions, or accidental releases would occur during the construction and decommissioning phases than during the O&M phase because of increased vessel traffic, fugitive dust emissions, and increased use of construction equipment and vehicles. Sunrise Wind has developed an EM&CP and would implement protection, mitigation and enhancement measures to minimize or eliminate potential impacts. Pollutant emissions are not expected to exceed NAAQS because emissions would be spread out in time over the 2-year construction phase, would be less during the O&M and decommissioning phases, and would occur over a large geographic area. Over the lifetime of the Proposed Action, emissions would decrease as emission control technologies improve and emission control standards become more stringent. As the Proposed Action and other offshore wind projects come online, BOEM anticipates that overall emissions from fossil-fuel power generation would decrease and would contribute to a **minor** to **moderate beneficial** indirect impact on air quality through avoided emissions and health benefits.

While there would be emissions of GHGs and criteria pollutants during the construction, O&M, and decommissioning phases, these emissions would be less than the total avoided emissions possible from the proposed Project and would provide **minor** to **moderate beneficial** impacts on air quality. The minimum potential annual avoided CO_2e emissions from the proposed Project are estimated as 2,078,623 tons (1,885,695 metric tons) (COP Appendix K; AKRF 2021). The potential offshore CO_2e emissions during construction of the proposed Project are approximately 10 times less (230,504 tons [209,110 metric tons]) and 2 to 4 orders of magnitude lower than potential onshore construction emissions. The range of potential annual avoided NO_x emissions (1,179 to 1,474 tons [1,070 to 1,337 metric tons]) is similar to the potential emissions during construction of the proposed Project (less than 10 tpy [9.1 metric tons] to approximately 1,000 tpy [907 metric tons] depending on location). However, the minimum expected total avoided NO_X emissions over the 25-to 35-year lifetime of the proposed Project is 29,486 tons (26,749 metric tons) (COP Appendix K; AKRF 2021). Similarly, the range of potential annual avoided VOC emissions (85 tons to 106 tons [77 to 96 metric tons]) is higher than the potential construction, O&M, and decommissioning emissions. Thus, the emissions during construction and operation of the proposed Project would be offset by the avoided emissions and would provide an overall **minor** to **moderate beneficial** impact.

The Council of Environmental Quality (CEQ) issued interim guidance on the consideration of GHGs and climate change under NEPA and recommends that agencies provide context for GHG emissions through the use of the "social cost of greenhouse gases" (SC-GHG) to translate climate impacts into the metric of dollars (CEQ 2023). The SC-GHG consists of the sum of the social cost of carbon, social cost of methane, and the social cost of nitrous oxide and is a monetary estimate of the economic impact of an incremental increase (i.e., emission) of a GHG in a given year. The SC-GHG reflects the social benefits of

reducing emissions or the social costs of increasing emissions of the gas in question by one ton (IWG 2021). The SC-GHG includes the value of all climate change impacts, such as changes in agricultural productivity, human health effects, property damage from increased flood risks, risk of conflict, environmental migration, and disruption of energy systems (IWG 2021).

SC-GHG estimates were developed by the Interagency Working Group (IWG) on SC-GHG and published in its Technical Support Document (IWG 2021). A key parameter used in the estimate of the SC-GHG is the discount rate which accounts for the "time value of money" or the general preference for receiving economic benefits now rather than later, by discounting benefits received later. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are less valuable or are a less significant factor in present-day decisions) (IWG 2021). In order to account for the uncertainty associated with climate change, the IWG recommends using a range of discount rates to produce a range of estimates for the SC-GHG. IWG developed the current set of interim estimates of SC-GHG using three different annual discount rates: 2.5 percent, 3 percent, and 5 percent (IWG 2021). The state of New York has developed SC-CO_2, SC-CH_4, and SC-N_2O and recommends using discount rates of 1, 2, and 3 percent (NYSDEC 2022). The analysis presented below uses the SC-GHG developed by the state of New York for discount rates of 1, 2, and 3 percent, and the SC-GHG recommended by the IWG for a 5 percent discount rate to provide a range for the SC-GHG associated with the proposed Project.

Table 3.4-8 presents the SC-CO_2, SC-CH_4, SC-N_2O, and SC-GHG estimates associated with emissions from the proposed Project in 2020 dollars. The following years were used for estimating the SC-GHG: construction 2023-2025, O&M 2026-2060, and decommissioning 2061-2062. The negative values based on the minimum and maximum avoided emissions from the OCS air permit reflect a social benefit of avoided emissions. A negative value for the minimum and maximum net SC-GHG indicates that the impact of the Proposed Action would be a net benefit in terms of SC-GHG. Based on the range of discount rates, the SC-GHG associated with construction, O&M, and decommissioning was estimated to range from $79,000,000 to $2,677,000,000 (Table 3.4-8). The net social cost of CO_2, CH_4, and N_2O ranged from -$695,000,000 to -$50,297,000,000; -1,300,000 to -32,000,000; and $100,000 to -37,000,000, respectively. The overall net benefit in terms of SC-GHG ranges from $696,000,000 to $50,367,000,000.

Table 3.4-8. Estimated Social Cost of Greenhouse Gases Associated with the Proposed Action (2020 $) (x10^6)

Description	1% Discount Rate	2% Discount Rate	3% Discount Rate	5% Discount Rate
Social Cost of CO_2				
Construction, O&M, decommissioning	2,634	762	304	77
Minimum avoided emissions	-28,664	-8,163	-3,209	-773
Maximum avoided emissions	-52,931	-15,074	-5,926	-1,427

Description	1% Discount Rate	2% Discount Rate	3% Discount Rate	5% Discount Rate
Minimum net social cost-CO_2	-26,030	-7,401	-2,905	-695
Maximum net social cost-CO_2	-50,297	-14,312	-5,622	-1,349
Social Cost of CH_4				
Construction, O&M, decommissioning	0.32	0.13	0.07	0.03
Minimum avoided emissions	-18	-7	-4	-1.3
Maximum avoided emissions	-33	-13	-7	-2.4
Minimum net social cost-CH_4	-17	-7	-4	-1.3
Maximum net social cost-CH_4	-32	-13	-7	-2.3
Social Cost of N_2O				
Construction, O&M, decommissioning	42	13	5	1.4
Minimum avoided emissions	-45	-13	-5	-1.4
Maximum avoided emissions	-79	-24	-9	-2.4
Minimum net social cost-N_2O	-2	-1	-0.1	0.1
Maximum net social cost-N_2O	-37	-11	-194	-1.0
Social Cost of GHG				
Construction, O&M, decommissioning	2,677	775	309	79
Minimum avoided emissions	-28,727	-8,184	-3,218	-775
Maximum avoided emissions	-53,043	-15,111	-5,942	-1,432
Minimum net social cost-GHG	-26,050	-7,409	-2,909	-696
Maximum net social cost-GHG	-50,367	-14,336	-5,633	-1,353

Notes:

CO_2 = carbon dioxide, CH_4 = methane, N_2O = nitrous oxide, GHG = greenhouse gas

Cumulative Impacts from the Proposed Action

As the Proposed Action and other offshore wind projects come online, BOEM anticipates that overall emissions from fossil-fuel power generation would decrease and would contribute to a **minor** to **moderate beneficial** indirect impact on air quality through avoided emissions and health benefits.

3.4.6 Alternative C-1 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

Alternative C-1 would have the same number of turbine locations (up to 94 WTGs) as the Proposed Action that BOEM may approve; however, 8 WTG positions from Priority Area 1 would be excluded from consideration for development. There would be no changes to the onshore facilities, the SRWEC alignments, or the construction timeline and activities. The changes proposed in Alternative C-1 would focus on the arrangement and generating capacity of the WTGs and necessary rearrangement of the IAC to accommodate the new spatial arrangements. Therefore, the discussion of impacts in these sections would focus on the attributes that are substantively different from those under the Proposed Action. In addition, the changes in spatial arrangement are unlikely to affect the duration, intensity, or magnitude of the effects described for the following IPFs: air emissions, climate change, and accidental releases. NEPA directs that an EIS focus on the differences among the alternatives to allow evaluation of their comparative merits. This focus does not disregard the impacts previously described, but the reader is directed to review the direct and indirect impacts on air quality resources described under the Proposed Action in section 3.4.5. A comparison of the alternatives and their potential impacts by IPF is provided in Section 3.4.9.

3.4.6.1 Construction and Installation

3.4.6.1.1 Onshore Activities and Facilities

Under Alternative C-1, impacts on air quality from air emissions, climate change, and accidental releases from onshore construction and installation activities would be the same as described above for the Proposed Action.

3.4.6.1.2 Offshore Activities and Facilities

Under Alternative C-1, the construction of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Air, GHG, and HAP emissions would occur from the same sources as described for the Proposed Action. There would be no substantive difference in the potential for impacts to air quality from air emissions, climate change, or accidental releases under Alternative C-1 as compared to the Proposed Action.

3.4.6.2 Operations and Maintenance

3.4.6.2.1 Onshore Activities and Facilities

Under Alternative C-1, impacts on air quality from air emissions, climate change, and accidental releases during onshore O&M activities would be the same as described above for the Proposed Action.

3.4.6.2.2 Offshore Activities and Facilities

Under Alternative C-1, there would be no substantive differences in the potential impacts to air quality from air emissions, climate change, and accidental releases during O&M compared to the Proposed Action because the same number of WTGs would be operated and require maintenance. The maintenance schedule would likely be similar to the Proposed Action.

3.4.6.3 Conceptual Decommissioning

3.4.6.3.1 Onshore Activities and Facilities

Impacts on air quality from air emissions, climate change, and accidental releases during onshore decommissioning activities would be the same as described above for the Proposed Action.

3.4.6.3.2 Offshore Activities and Facilities

There would be no substantive differences in the potential impacts to air quality from air emissions, climate change, and accidental release during decommissioning of the offshore facilities compared to the Proposed Action because the same number of WTGs would need to be decommissioned.

3.4.6.4 Cumulative Impacts of Alternative C-1

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to air quality impacts from ongoing and planned activities would not be materially different than the Proposed Action. Ongoing and planned activities, including the Proposed Action or Alternative C-1, would have a **minor** to **major** beneficial impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.6.5 Conclusions

Impacts of Alternative C-1

Under Alternative C-1, impacts on air quality from onshore construction, O&M, and decommissioning would be the same as those described for the Proposed Action. Impacts on air quality from offshore construction, O&M, and decommissioning would not change substantially under Alternative C-1 compared to the impacts described above for the Proposed Action because the same number of WTGs would be installed, maintained, and decommissioned. Under Alternative C-1, the offshore construction

and decommissioning phases would be completed in a similar amount of time as compared to the Proposed Action. BOEM expects Alternative C-1 would have a **minor** to **moderate** short-term impact on air quality but would be dispersed throughout the construction, O&M, or decommissioning phases and would have a **minor** to **moderate beneficial** impact due to reduced fossil fuel energy emissions.

Cumulative Impacts of Alternative C-1

BOEM anticipates impacts would be similar to the cumulative impacts of the Proposed Action. Ongoing and planned activities, including Alternative C-1, would have a **minor** to **moderate beneficial** impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.7 Alternative C-2 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

For Alternative C-2, the analysis was expanded upon to relocate up to 12 additional WTG positions from the Priority Areas to the eastern side of the Lease Area, in addition to removing up to 8 WTG positions identified in Alternative C-1. This alternative assumes that habitat is more suitable for development on the eastern side of the Lease Area, but surveys conducted in this area in the summer of 2022 found that the southeastern side of the Lease Area contains glauconite substrate that is unsuitable for WTG installation.

3.4.7.1 Construction and Installation

3.4.7.1.1 Onshore Activities and Facilities

Under Alternative C-2, impacts on air quality from air emissions, climate change, and accidental releases from onshore construction and installation activities would be the same as described above for the Proposed Action.

3.4.7.1.2 Offshore Activities and Facilities

Under Alternative C-2, the construction of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Air, GHG, and HAP emissions would occur from the same sources as described for the Proposed Action. Under Alternative C-2, emissions from vessel traffic and installation of the IAC may be slightly more than the Proposed Action because of the longer distance needed to reach the eastern side of the Lease Area.

3.4.7.2 Operations and Maintenance

3.4.7.2.1 Onshore Activities and Facilities

Under Alternative C-1, impacts on air quality from air emissions, climate change, and accidental releases during onshore O&M activities would be the same as described above for the Proposed Action.

3.4.7.2.2 Offshore Activities and Facilities

Under Alternative C-2, the O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Air, GHG, and HAP emissions would occur from the same sources as described for the Proposed Action. Under Alternative C-2, emissions during O&M of the WTGs or IAC may be marginally higher than the Proposed Action because of the longer vessel travel distance and longer length of IAC needed to reach the eastern side of the Lease Area; however, O&M activities of the IAC would be infrequent.

3.4.7.3 Conceptual Decommissioning

3.4.7.3.1 Onshore Activities and Facilities

Impacts on air quality from air emissions, climate change, and accidental releases during onshore decommissioning activities would be the same as described above for the Proposed Action.

3.4.7.3.2 Offshore Activities and Facilities

Under Alternative C-2, air quality impacts from air emissions, climate change, and accidental release during decommissioning would be marginally higher than the Proposed Action because of the longer distance and IAC length needed to reach the eastern side of the Lease Area.

3.4.7.4 Cumulative Impacts of Alternative C-2

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to air quality impacts from ongoing and planned activities would be marginally more than the Proposed Action. Ongoing and planned wind projects, including the Proposed Action, Alternative C-1, or Alternative C-2, would have a minor to moderate beneficial impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.7.5 Conclusions

Impacts of Alternative C-2

Under Alternative C-2, impacts on air quality from onshore construction, O&M, and decommissioning would be the same as those described for the Proposed Action and Alternative C-1 because the onshore activities would be the same under all alternatives. Impacts on air quality from offshore construction,

O&M, and decommissioning would be slightly more under Alternative C-2 compared to the impacts described above for the Proposed Action and Alternative C-1 because of increased vessel emissions due to the longer distance needed to reach the eastern side of the Lease Area and because of the longer length of IAC that would need to be installed, maintained, and decommissioned. Alternative C-2 would have a **minor** to **moderate** adverse impact on air quality and a **minor** to **moderate beneficial** impact due to reduced fossil fuel energy emissions.

Cumulative Impacts of Alternative C-2

Ongoing and planned wind projects, including the Proposed Action, Alternative C-1, or Alternative C-2, would have a **minor** to **moderate beneficial** impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternatives C-3a, C-3b, and C-3c consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the New York State Energy Research and Development Authority (NYSERDA) Offshore Wind Renewable Energy Certificate (OREC). This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Under Alternative C-3a, up to 87 11-MW WTGs would be installed in the 87 potential positions. Under Alternative C-3b, up to 84 WTGs would be installed in the 87 potential positions. Under Alternative C-3c, 80 WTGs would be installed in the 87 potential positions.

3.4.8.1 Construction and Installation

3.4.8.1.1 Onshore Activities and Facilities

Under Alternative C-3 impacts on air quality from air emissions, climate change, and accidental releases from onshore construction and installation activities would be the same as described above for the Proposed Action.

3.4.8.1.2 Offshore Activities and Facilities

Under Alternative C-3, the construction of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Air, GHG, and HAP emissions would occur from the same sources as described for the Proposed Action. Under Alternative C-3, a reduced number of WTGs would be installed resulting in slightly less emissions due to construction of the WTGs; however, emissions from vessel traffic and installation of the IAC may

be slightly more than the Proposed Action because of the longer distance needed to reach the eastern side of the Lease Area.

3.4.8.2 Operations and Maintenance

3.4.8.2.1 Onshore Activities and Facilities

Under Alternative C-3, impacts on air quality from air emissions, climate change, and accidental releases during onshore O&M activities would be the same as described above for the Proposed Action.

3.4.8.2.2 Offshore Activities and Facilities

Under Alternative C-3, the O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Air, GHG, and HAP emissions would occur from the same sources as described for the Proposed Action. Under Alternative C-3, a reduced number of WTGs would be installed resulting in slightly less emissions due to O&M of the WTGs. O&M of the IAC would be infrequent and not substantially different from the Proposed Action.

3.4.8.3 Conceptual Decommissioning

3.4.8.3.1 Onshore Activities and Facilities

Impacts on air quality from air emissions, climate change, and accidental releases during onshore decommissioning activities would be the same as described above for the Proposed Action.

3.4.8.3.2 Offshore Activities and Facilities

Under Alternative C-3, air quality impacts from air emissions, climate change, and accidental release during decommissioning would be marginally lower than the Proposed Action because of the smaller number of WTGs that would be installed.

3.4.8.4 Cumulative Impacts of Alternative C-3

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-3 to air quality impacts from ongoing and planned activities would be marginally lower than the Proposed Action. Ongoing and planned wind projects, including the Proposed Action, Alternative C-1, Alternative C-2, or Alternative C-3 would have a minor to moderate beneficial impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.8.5 Conclusions

Impacts of Alternative C-3

Under Alternative C-3, impacts on air quality from onshore construction, O&M, and decommissioning would be the same as those described for the Proposed Action, Alternative C-1, and Alternative C-2 because the onshore activities would be the same under all alternatives. Impacts on air quality from offshore construction, O&M, and decommissioning would be slightly less under Alternative C-3 compared to the impacts described above for the Proposed Action, Alternative C-1, and Alternative C-2 because less construction, O&M, and decommissioning emissions would occur due to fewer WTGs. Alternative C-3 would have a **minor** to **moderate** impact on air quality and a minor to moderate beneficial impact due to reduced fossil fuel energy emissions.

Cumulative Impacts of Alternative C-3

Ongoing and planned wind projects, including the Proposed Action, Alternative C-1, Alternative C-2, or Alternative C-3 would have a **minor** to **moderate beneficial** impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.9 Comparison of Alternatives

BOEM used the USEPA AVERT v4.0 model to estimate the avoided CO_2 emissions for the New York region over the proposed Project's operational lifespan using the default capacity factors in the model. Table 3.4-9 presents the construction emissions for Years 1-3, the O&M emissions for Years 4 to 38, the avoided emissions, net emissions, and operational lifetime new emissions for each alternative. The Proposed Action would result in an annual reduction of 1,728,127 tons of CO_2, equivalent to the removal of 348,867 gasoline-powered passenger vehicles driven for one year (USEPA 2023d). Over the operational lifetime of the Project, there would be an estimated reduction of 60,484,445 tons of CO_2. Alternatives C-1 and C-2 would produce the same, avoided, and net emissions because those alternatives have the same generation capacity, and the same number of WTGs would be installed as the Proposed Action.

The No Action Alternative would result in no emissions during construction or O&M because the proposed Project would not be built. This alternative would provide no avoided emissions resulting in higher CO_2 emissions over the lifetime of the Project and equivalent to adding 365,135 vehicles per year. These estimates are relative to the existing grid configuration, but the actual annual quantity of avoided emissions attributable to the proposed Project is expected to diminish over time if the electric grid becomes lower-emitting due to the addition of other renewable energy facilities and the retirement of high-emitting generators.

Under Alternative C-3a, up to 87 11-MW WTGs would be installed, resulting in a reduction in avoided emissions and construction and O&M emissions of approximately 7.4 percent compared to the Proposed Action. By reducing the energy produced, the avoided emissions would be reduced. The emission reduction under this alternative would be equivalent to removing 322,973 vehicles driven for one year. Under Alternatives C-3b and C-3c, up to 84 11-MW WTGs and 80 11-MW WTGs would be installed, respectively, resulting in approximately 11 percent and 15 percent reductions in avoided, construction,

and O&M emissions compared to the Proposed Action. This would be equivalent to the removal of 311,870 gas-powered passenger vehicles driven under Alternative C-3b or 297,044 vehicles driven per year under Alternative C-3c.

Table 3.4-9. Net Emissions of Carbon Dioxide (CO_2) for each Alternative

Annual CO_2 Emissions (U.S. tons)	Construction Emissions (Years 1-3)	O&M Emissions (Years 4-38)	Years 4-38 (Avoided Emissions)	Years 4-38 (Net Emissions)	Operational Lifetime Net Emissions
Alternative A No Action	0	0	0	0	0
Alternative B Proposed	828,278	80,583	1,808,710	-1,728,127	-60,484,445
Alternative C1	828,278	80,583	1,808,710	-1,728,127	-60,484,445
Alternative C2	828,278	80,583	1,808,710	-1,728,127	-60,484,445
Alternative C-3a	766,598	74,582	1,674,440	-1,599,858	-55,995,025
Alternative C-3b	740,163	72,010	1,616,870	-1,544,860	-54,070,088
Alternative C-3c	704,917	68,581	1,540,000	-1,471,419	-51,499,655

*Assumes 35-year operational lifetime of the Project.

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall minor to moderate adverse impacts and minor to moderate beneficial impacts on air quality resources. However, the magnitude of impacts on air quality from offshore construction, O&M, and decommissioning would be slightly more under Alternative C-2 when compared to Alternative B, C-1, and C-3 because of increased vessel traffic due to the longer distance to the eastern side of the Lease Area and length of IAC. Impacts on air quality would be slightly less under Alternative C-3 compared to the impacts described above for the Proposed Action, Alternative C-1, and Alternative C-2 because less construction, O&M, and decommissioning emissions would occur due to fewer WTGs and reduced length of IAC. Table 3.4-10 provides an overall summary of alternative impacts.

Table 3.4-10. Comparison of Alternative Impacts on Air Quality

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C1)	Fisheries Habitat Minimization (Alternative C2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: The No Action Alternative would have a **minor** to **moderate** adverse impact on air quality due to ongoing activities that produce air, GHG, and HAP emissions. **Minor** to **moderate beneficial** impacts could occur from avoided fossil-fuel emissions. *Cumulative Impacts of the No Action Alternative:* Existing environmental trends and ongoing and planned activities would have **minor** to **moderate** impacts on air quality. Planned offshore wind activities would have an indirect **minor** to **moderate beneficial** impact on air quality because of reduced emissions from fossil-fuel powered electricity generation sources and the associated health benefits.	*Proposed Action:* The Proposed Action would have a short-term **minor** to **moderate** adverse effect from air emissions, climate change, and accidental releases. While there would be emissions of GHGs and criteria pollutants during the construction, O&M, and decommissioning phases, these emissions would be less than the total avoided emissions possible from the proposed Project and would provide **minor** to **moderate beneficial** impacts. *Cumulative Impacts of the Proposed Action:* The potential emissions from onshore and offshore activities during the construction and installation, O&M, and decommissioning phases would have a **minor** to **moderate** adverse cumulative impact on air quality but would be short-term and dispersed throughout the construction, O&M,	*Alternative C-1:* Alternative C-1 would have a **minor** to **moderate** adverse effect from air emissions, climate change, and accidental releases. **Minor** to **moderate beneficial** indirect impact from reduced emissions from fossil-fueled energy sources and associated health benefits. *Cumulative Impacts of Alternative C-1:* The potential emissions from onshore and offshore activities during the construction and installation, O&M, and decommissioning phases would have a **minor** to **moderate** adverse cumulative impact on air quality but would be short-term and dispersed throughout the construction, O&M, or decommissioning phases. Ongoing and planned activities, including Alternative C-1, would have a **minor** to **moderate beneficial** impact on air quality because of reduced emissions	*Alternative C-2:* Alternative C-2 would have a **minor** to **moderate** adverse effect from air emissions, climate change, and accidental releases. **Minor** to **moderate beneficial** indirect impact from reduced emissions from fossil-fueled energy sources and associated health benefits. *Cumulative Impacts of Alternative C-2:* The potential emissions from onshore and offshore activities during the construction and installation, O&M, and decommissioning phases would have a **minor** to **moderate** adverse cumulative impact on air quality but would be short-term and dispersed throughout the construction, O&M, or decommissioning phases. Ongoing and planned wind projects, including Alternative C-2, would have a **minor** to **moderate beneficial** impact on air quality because of reduced emissions	*Alternative C-3:* Alternative C-3 would have a **minor** to **moderate** adverse effect from air emissions, climate change, and accidental releases. **Minor** to **moderate beneficial** indirect impact from reduced emissions from fossil-fueled energy sources and associated health benefits. *Cumulative Impacts of Alternative C-3:* The potential emissions from onshore and offshore activities during the construction and installation, O&M, and decommissioning phases would have a **minor** to **moderate** adverse cumulative impact on air quality but would be short-term and dispersed throughout the construction, O&M, or decommissioning phases. Ongoing and planned wind projects, including Alternative C-3, would have a **minor** to **moderate beneficial** impact on air quality because of reduced emissions

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C1)	Fisheries Habitat Minimization (Alternative C2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
	or decommissioning phases. BOEM anticipates that overall emissions from fossil fuel power generation would decrease and would contribute to a **minor** to **moderate beneficial** indirect impact on air quality through avoided emissions and health benefits.	from fossil-fuel powered electricity generation sources and the associated health benefits.	from fossil-fuel powered electricity generation sources and the associated health benefits.	from fossil-fuel powered electricity generation sources and the associated health benefits.

3.4.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-11. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Impacts on air quality from offshore construction, O&M, and decommissioning would be slightly less under Alternative C-3 compared to the impacts described above for the Proposed Action, Alternative C-1, and Alternative C-2 because less construction, O&M, and decommissioning emissions would occur due to fewer WTGs. Under Alternatives C-3b, up to 84 11-MW WTGs would be installed, resulting in approximately 11 percent reductions in avoided, construction, and O&M emissions compared to the Proposed Action. This would be equivalent to the removal of 311,870 gas-powered passenger vehicles driven. Alternative C-3 would have a minor to moderate adverse impact on air quality.

3.4.11 Proposed Mitigation Measures

The mitigation measures listed in Table 3.4-11 are recommended for inclusion in the Preferred Alternative.

Table 3.4-11. Proposed Mitigation Measures: Air Quality

Measure	Description	Effect
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.	Reduced vessel emissions during construction, O&M, and decommissioning

3.4.11.1 Effect of Measures Incorporated into the Preferred Alternative

The mitigation measures listed in Table 3.4-11 are recommended for inclusion in the Preferred Alternative. The measure, if adopted, would serve to reduce the potential impacts to air quality through the use of efficient and low emission vessels throughout the life of the project. Because this measure, if adopted, would be implemented regardless of which alternative is identified as the Preferred Alternative, impacts levels discussed above in Section 3.4.5, 3.4.6, 3.4.7 and 3.4.8 would remain unchanged. As such, the Preferred Alternative would have a minor to moderate adverse impact on air quality.

3.5 Water Quality

This section discusses the existing water quality conditions and the potential impacts on water quality from the Proposed Action, the alternatives, and future offshore wind farm development. The GAA (refer to Figure D-2 in Appendix D [*Geographical Analysis Areas*]) includes onshore waters crossed by Project components, a 10-mi (16.1-km) buffer around the offshore Project components, transit routes, and a 15.5-mi (24.9-km) buffer around the ports that may be used for the Proposed Action. Important parameters used to describe the water quality of an area include dissolved oxygen (DO), water temperature, pH, chlorophyll-a, turbidity, salinity, nutrients, and contaminants.

3.5.1 Description of the Affected Environment and Future Baseline Conditions

Water quality within the GAA is managed under the Clean Water Act (CWA) at the federal level by BOEM and USACE, and at the state level by New York, Rhode Island, and Massachusetts agencies. BOEM has jurisdiction over offshore water quality for waters containing the SRWF and SRWEC. New York has jurisdiction over the waterbodies crossed by the SRWEC-NYS and the onshore facilities (Sunrise Wind 2023). The NPS has administrative authority over all waters subject to the jurisdiction of the United States within the legislative boundary of the Fire Island National Seashore, including the water column from the mean high water line up to 4,000 feet (ft; 1,219.2 meters [m]) into Great South Bay, Narrows Bay, and Moriches Bay, and to 1,000 ft (304.8 m) into the Atlantic Ocean, from the eastern boundary of Robert Moses State Park to the western side of Moriches Inlet. New York State (NYS) holds the title to the Atlantic Ocean, including the seafloor, within the park boundary but has granted use and occupancy rights and ceded concurrent jurisdiction to the United States along the ocean for the entire length of the park boundary. New York, Rhode Island, and Massachusetts have authority over concurrence with the Coastal Zone Management Act Federal Consistency Certification.

Sources of pollution to water include point sources, such as pipe or sewer outflows, wastewater or industrial discharges, and non-point sources which include land use practices (e.g., agriculture, urban and stormwater runoff, atmospheric deposition) (COP, Section 4.3.3.1; Sunrise Wind 2023). Water quality in the area is influenced by river runoff (e.g., Connecticut River), surface runoff (from coastal cities), and spills or leaks of chemicals or wastes.

3.5.1.1 Onshore

The state of New York assigns all waters a classification to describe its best uses and its applicable narrative or numeric water quality standards. Information relevant to the proposed Project Area can be found in the New York Codes, Rules, and Regulations Title 6 (6NYCRR). The onshore transmission cable would cross the Intracoastal Waterway (ICW) and Carmans River. The ICW is the area of Great South Bay between Smith Point County Park on Fire Island and Smith Point Marina on Long Island. The state of New York classifies the water in this area as Class SA (NYSDEC 2021a). Class SA water uses include shellfishing for market purposes, primary and secondary contact recreation, and fishing; the waters shall

be suitable for fish, shellfish, and wildlife propagation and survival (NYCRR 2021b). Applicable water quality standards are provided in Table 3.5-1 (NYCRR 2021c, 2021d).

Table 3.5-1. Narrative and Numeric Water Quality Standards for Class SA and Class C(TS) Waters

Parameter	Class C(TS)	Class SA and SC
pH	Shall not be less than 6.5 nor more than 8.5.	The normal range shall not be extended by more than one-tenth (0.1) of a pH unit.
DO	For trout spawning (TS) waters the DO concentration shall not be less than 7.0 mg/L from other than natural conditions.	Shall not be less than a daily average of 4.8 mg/L
Dissolved solids	Shall be kept as low as practicable to maintain the best usage of waters but in no case shall it exceed 500 mg/L.	N/A
Taste-, color-, and odor-producing, toxic and other deleterious substances	None in amounts that would adversely affect the taste, color or odor thereof, or impair the waters for their best usages.	
Turbidity	No increase that would cause a substantial visible contrast to natural conditions.	
Phosphorus and nitrogen	None in amounts that would result in growths of algae, weeds and slimes that would impair the waters for their best usages.	

Source: NYCRR 2021c, 2021d.

Notes:
pH = acidity or basicity of an aqueous solution, DO = dissolved oxygen, mg/L = milligram per liter

The Carmans River, located in the town of Brookhaven in Suffolk County, is one of four major rivers on Long lsland, New York. It is within the Atlantic-Long Island Sound water basin, which drains all of Long Island (NYSDEC 2022a). The Carmans River originates in the central portion of Long Island and flows south-southeast through the Central Pine Barrens and Wertheim National Wildlife Refuge and empties into Bellport Bay; it is approximately 10 mi (16.1 km) long (TU 2022). The river's upper 8-mi (12.9-km) reach is freshwater, and the lower 2 mi (3.2 km) are brackish. The section of the Carmans River that would be crossed by the onshore transmission cable is freshwater (COP Appendix L; Stantec 2022) and is classified by the state of New York as Class C(TS), meaning it is Class C and standards for trout spawning waters apply (NYCRR 2021a). The tidal portion of the Carmans River is Class SC. The best use of Class C and Class SC water is fishing, and the water shall be suitable for fish, shellfish, and wildlife propagation and survival, and primary and secondary contact recreation (NYCRR 2021e). The tidal portion of the Carmans River is Class SC. Applicable water quality standards are provided in Table 3.5-1 (NYCRR 2021c, 2021d).

The water quality of Carmans River is influenced by the groundwater that feeds the river, atmospheric deposition, surface and stormwater runoff, agriculture, wastewater, biological activity, and vegetation (Town of Brookhaven 2013). The Carmans River is primarily (95 percent) fed by groundwater from the Nassau/Suffolk Long Island Sole Source aquifer. This aquifer underlies Long Island and is the sole source of freshwater (USEPA 2021a); all the onshore components would cross the aquifer. Contaminants were

documented in the Carmans River drainage area that have impacted the groundwater quality but have not affected the river (NYSDEC 2008). The town of Brookhaven adopted the Carmans River Conservation and Management Plan to preserve and protect land within the watershed and water quality in the river and to prevent water quality degradation (Town of Brookhaven 2013).

NYSDEC completed a biological and water quality assessment of the Carmans River in September 2008 (NYSDEC 2008). One of the monitoring sites was just downstream of where the onshore transmission cable would cross the river. The biological assessment profile indicated a slight to moderate impact from a natural state depending on the biological index reflecting good to poor water quality. The DO concentration was 9.6 mg/L and pH was 7.4. The nutrient biotic index for phosphorus and nitrogen indicated eutrophic conditions. Municipal and industrial sources were identified as the source of water quality impacts.

The reach of the Carmans River from approximately 0.4 river miles (RM) (0.6 km) downstream of the crossing site to approximately 7 RMs (11.3 km) upstream was listed as impaired for pH in the draft 2020-2022 CWA Section 303(d) List of Impaired Waters (NYSDEC 2022b). The Carmans River is designated as impaired for its best use (i.e., fishing) because of pH (NYSDEC 2021a). Great South Bay was listed as impaired due to DO and nitrogen levels in 2010; the uses of fishing and secondary contact recreation are listed as impaired (NYSDEC 2021b). Suffolk County developed the Suffolk County Subwatershed Wastewater Plan to address degrading water quality conditions due to high nitrogen levels in marine freshwater and groundwater (SCDHS 2020). Wastewater is the predominant source of nitrogen pollution, followed by fertilizer. Nitrogen concentrations in Great South Bay have increased by 20 percent to 30 percent over the past 15 years (SCDHS 2020).

The United States Geological Survey (USGS) maintains a site (USGS No. 01305000 Carmans River at Yaphank, New York) approximately 3 RMs (4.8 km) upstream of where the onshore transmission cable would cross the Carmans River that monitors river flow and several water quality parameters (USGS 2023). Water quality data collected since 2014 is provided in Table 3.5-2. Water temperature and DO exhibit the typical seasonal variations. DO concentrations were higher in winter/spring and lower in the summer/early fall pH ranged from 6.5 to 7.0 (Table 3.5-2).

Table 3.5-2. Water Quality Data Collected at USGS No. 01305000 Carmans River at Yaphank, New York

Date	Water Temperature (°C)	Specific Conductance (µS/cm)	DO (mg/L)	DO Percent Saturation	pH	Dissolved Solids (mg/L)	Organic Nitrogen (mg/L)	Nitrate+Nitrite (mg/L)	Orthophosphate (mg/L as PO_4)	Phosphorus (mg/L)
9/24/2014	16.3	197	9.5	97	6.8	117	< 0.13	1.44	< 0.012	0.008
3/12/2015	8.7	192	11.5	97	6.6	111	0.2	1.63	0.023	0.01
6/19/2015	21.5	195	9.1	103	6.8	116	0.82	1.27	0.024	0.01
9/25/2015	16.6	213	8.7	88	6.7	121	0.23	1.37	0.015	0.006
3/30/2016	12.9	202	11.4		6.5	121	0.16	1.62	0.014	0.006
6/30/2016	22.7	214	8.8	102	6.9	125	0.25	1.25	< 0.012	0.009
9/23/2016	18.6	218	8.5	91	6.8	122	0.33	1.3	< 0.012	0.007
11/14/2017	7.4	216	11.1	91	6.7	127	0.37	1.74	0.019	0.005
3/19/2018	8	217	11.9	101	6.7	122	0.27	1.82	0.016	0.007
5/30/2018	18.5	201	7.8	83	6.5	117	0.13	1.49	0.016	0.006
9/21/2018	18.9	229	7.5	80	6.6	125	0.78	1.69	0.03	0.011
11/29/2018	8.6	208	10.8		6.9	113	0.5	1.98	0.036	0.012
3/25/2019	9.3	208	10.7		6.9	123	0.25	2.09	0.035	0.006
6/03/2019	17.7	214	9.2		6.7	121	0.27	1.73	0.022	0.009
6/07/2019	20.5	219	8.2		6.6					
8/29/2019	18.8	209	8.3		6.7	118	0.32	1.46	0.024	0.008
11/06/2019	10.3	210	9.5		7	121	0.15	1.91	0.019	0.008

Date	Water Temperature (°C)	Specific Conductance (µS/cm)	DO (mg/L)	DO Percent Saturation	pH	Dissolved Solids (mg/L)	Organic Nitrogen (mg/L)	Nitrate+Nitrite (mg/L)	Orthophosphate (mg/L as PO_4)	Phosphorus (mg/L)
2/24/2020	7.1	198	11.6		6.5	121	0.19	2.06	< 0.012	0.005
5/26/2020	20	203	9.1	99	6.6	117	0.23	1.42	< 0.012	0.007
8/27/2020	19.6	204	8.4	92	6.7	109	< 0.19	1.22	< 0.012	0.009
11/09/2020	13.2	202	9.2	87	6.7	119	0.15	1.83	< 0.012	0.007
2/17/2021	5.7	193	11.9	94	6.8	116	< 0.26	1.95	< 0.012	0.004
5/04/2021	14.8	190	9.5	95	6.7	107	0.22	1.46	< 0.012	0.006
9/13/2021	19.6	203	8.2	89	6.5	113	< 0.15	1.5	0.016	0.008
11/16/2021	9.2	202	10.6	92	6.6	121	< 0.28	1.83	< 0.012	0.004
2/15/2022	2.5	210	12.3	88	6.7	117	0.23	2.04	< 0.012	0.006
6/2/2022	18.3	202	7.6	81	6.6	110	0.21	1.42	< 0.012	0.004
9/8/2022	17.7	202	7.8	82	6.6		0.14	1.33	0.018	0.007

Source: USGS 2023

Notes:

°C = degrees Celsius, µS/cm (microsiemens per centimeter); mg/L = milligram per liter, DO = dissolved oxygen, pH = acidity or basicity of an aqueous solution, PO_4 (phosphate).

The Suffolk County Department of Health Services (SCDHS) monitors water quality at a site approximately 2 RMs (3.2 km) downstream of where the onshore transmission cable cross would the Carmans River (station 95052) and at a site in the ICW (station 90100). Water quality monitoring results from 2015 to 2019 are provided in Table 3.5-3 (adapted from Table 4.3.3-1 and Section 4.3.3.1 of COP; Sunrise Wind 2023).

Table 3.5-3. Water Quality Monitoring Results Completed by the Suffolk County Department of Health Services in 2015 to 2019

Parameter	Station 95052	Station 90100
DO (mg/L)	1.3-11	3.9-12.3
Chlorophyll-a (µg/L)	0.6-44.9	0.53-53.29
Ammonia (mg/L)	0.054	0.073
Nitrite + Nitrate (mg/L)	0.83	1.09
Total Nitrogen (mg/L)	0.39	1.45
Orthophosphate (mg/L)	0.018	0.012
Total Phosphorus (mg/L)	0.064	0.083

Source: Sunrise Wind 2023

Notes:
DO = dissolved oxygen, mg/L = milligram per liter, µg/L = micrograms per liter

The water surrounding some of the proposed ports are listed on state impairment lists. The Port of Albany and the Port of Coeymans are on a reach of the Hudson River in New York that is listed as impaired for fishing because of polychlorinated biphenyl (PCB) pollution (NYSDEC 2022b). Port Jefferson Harbor in New York is listed for shellfishing and primary contact recreation due to fecal coliform. Upper New York Bay, containing the Port of Brooklyn and the Port of New York, is impaired for fishing because of PCBs and dioxins. The Port of Montauk at Lake Montauk, New York, is listed for fishing due to fecal coliform (NYSDEC 2022b). The Paulsboro Marine Terminal on the Delaware River in New Jersey is listed for not supporting fish consumption and aquatic life (NJ DEP 2022). The Thames River at the Port of New London in Connecticut is listed for not supporting marine aquatic life and shellfish (CT DEEP 2020). The New Bedford Marine Commerce Terminal in the New Bedford Inner Harbor in Massachusetts is listed for aesthetics, fish consumption, fish and other aquatic life and wildlife, recreation, and shellfish harvesting (MA DEP 2020). The Port of Providence on the Providence River, Rhode Island, is listed for fish and wildlife habitat because of DO and total nitrogen and for recreation because of fecal coliform (RI DEM 2022).

3.5.1.2 Offshore

The SRWF is located southeast of Block Island, and south of Rhode Island Sound on the OCS in the Mid-Atlantic Bight. The Mid-Atlantic Bight extends from Cape Lookout off North Carolina to Nantucket Shoals off southern New England. Water depths at the SRWF range from approximately 115 to 203 ft (35 to 62

m) (COP Section 4.3.1.1; Sunrise Wind 2023). Typical current velocities vary with depth with stronger currents near the surface that decrease with depth. Overall, surface currents flow to the west in spring to early summer and shift to the east in late summer to fall. Sediments at the SRWF generally consist of a mix of sand and muddy sand, silt, and clay in the southwest of the SRWF with courser sediments to the east and north (COP Section 4.3.2.1; Sunrise Wind 2023). No sand waves are present at the current proposed location of the SRWF. However, areas of sand accumulation in low relief areas were identified across the offshore area. Sediment along the SRWEC-OCS generally consists of sand and muddy sand with some areas of coarse gravelly sand, sand accumulation, and ripple areas.

Several reports describing data collected from waters offshore of Rhode Island and New York were reviewed and results are briefly summarized below to provide a general characterization of water quality in the GAA. Codiga and Ullman (2011) analyzed water temperature and salinity data collected between 1980 and 2007 and water temperature, salinity, DO, chlorophyll-a, and turbidity data collected in 2009 and 2010 for the Rhode Island Ocean Special Area Management Plan. Bathis et al. (2009) presents water quality data collected along the Mid-Atlantic Bight in May 2006 from a joint USEPA and NOAA program. The OceanReports tool was created by BOEM and NOAA to provide an online interactive tool to present environmental ocean characteristics for user-specified areas (NOAA 2021).

The USEPA prepared the National Coastal Condition Reports (NCCR) to describe the environmental conditions in coastal waters. The most recent report describes conditions for 2003 to 2006 (USEPA 2012). The NCCR provides ratings of poor, fair, or good for water quality parameters in coastal waters. In the most recent evaluation published in 2012, the Northeast coastal region (i.e., coastal and estuarine waters from Maine to Virginia) was rated as fair for water quality based on data for DO, chlorophyll-a, dissolved inorganic nitrogen, and dissolved inorganic phosphorus. There was a spatial gradient in the water quality rating with more sampling sites rated fair or good off the coasts of Massachusetts, Rhode Island, Connecticut, and eastern Long Island with more fair and poor sites in western Long Island, and near New York City and New Jersey (USEPA 2012).

In the SRWF and SRWEC-OCS area, water temperature and salinity vary seasonally causing the water column to stratify in late summer with reduced mixing between the surface and bottom waters (Codiga and Ullman 2011; COP Section 4.3.1.1; Sunrise Wind 2023). Upwelling bottom waters and storms in the fall cause mixing and disrupt the thermal stratification pattern. In winter, water temperatures near the surface range from approximately 39°F to 41°F (4°C to 5°C) while temperatures are 40°F to 43°F (4.5°C to 6°C) near the bottom. Water temperatures near the surface in summer are 64°F to 68°F (18°C-20°C) and 52°F to 55°F (11°C to 13°C) near the bottom. Surface water temperatures have a greater seasonal variation (up to 59°F or 15°C) than bottom waters (approximately 41°F or 5°C). Overall, water temperatures are cooler on the eastern side of the SRWF than on the west (Codiga and Ullman 2011; COP Section 4.3.1.1, Sunrise Wind 2023). Water temperatures recorded in May 2006 throughout the Mid-Atlantic Bight ranged from 46.0°F to 64.2°F (7.8°C to 17.9°C) near the surface and from 43.7°F to 59.4°F (6.5°C to 15.2°C) near the bottom (Bathis et al. 2009).

Several lease areas within the Rhode Island/Massachusetts WEAs, including the SRWF, are located on the approximate northern boundary of the Mid-Atlantic Bight cold pool which is a 65- to 200-ft (20-tov60-m)-thick layer of relatively cool water between Cape Hatteras and Georges Bank that is bounded above and onshore by the seasonal thermocline. The cold pool forms in spring and is maintained through the summer by stratification; there is interannual variability in the duration of the cold pool (e.g., Lentz 2017). Overall, water temperatures are less than approximately 10°C (50°F) in the spring and summer and are coldest in the New York bight and are warmer on the eastern side of the cold pool. The potential effects of extensive wind farm development on features like the cold pool is a topic of emerging interest and ongoing research (e.g., Chen et al. 2016; Lentz 2017).

Salinity ranges from approximately 31.5 to 34.5 practical salinity scale (PSS) throughout the GAA. In general, salinity increases with increasing depth and with distance offshore and is higher in the southern end of Rhode Island Sound near the SRWF (COP Section 4.3.1.1; Sunrise Wind 2023). Surface water salinities are highest in the fall and winter, decrease in the spring due to rain and melting, and begin increasing again in summer (Codiga and Ullman 2011; COP Section 4.3.1.1, Sunrise Wind 2023). In May 2006, salinity values near the surface were 31.2 to 33.3 PSS and were 32.2 to 34.4 PSS near the bottom of the Mid-Atlantic Bight (Bathis et al. 2009).

Ocean waters in the offshore Project Area have been shown to be well oxygenated (Bathis et al. 2009; Sunrise Wind 2023). DO concentrations vary seasonally with highest concentrations in early spring and lowest in early fall. In the Rhode Island Sound, DO was reported to be greater than 10 milligrams/liter (mg/L) in March 2009 and between 5 to 9 mg/L during the remainder of the year (Codiga and Ullman 2011). Throughout the Mid-Atlantic Bight, DO ranged from 7.7 to 9.7 mg/L near the surface and 8.1 mg/L to 9.9 mg/L near the bottom (Bathis et al. 2009). These values are considered to represent good water quality based on DO content (USEPA 2012).

Chlorophyll-a levels within the offshore Project Area have been observed to be low (less than 5 micrograms/liter [µg/L]) (Bathis et al. 2009; Codiga and Ullman 2011). Chlorophyll-a was observed to vary seasonally with values below 1 µg/L in summer and 1 to 3 µg/L in spring (NOAA 2021; Sunrise Wind 2023). Chlorophyll-a concentrations less than 5 µg/L are considered good quality (USEPA 2012). Overall, the northeast coastal region was rated fair which represents chlorophyll-a concentrations ranging from 5 to 20 µg/L (USEPA 2012).

The NCCR report rated dissolved inorganic nitrogen and dissolved inorganic phosphorus in Northeast Coastal Waters as good (concentrations of less than 0.1 mg/L) and fair (concentrations ranging from 0.01 to 0.05 mg/L), respectively (USEPA 2012). Bathis et al. (2009) reported dissolved inorganic nitrogen concentrations of 0.01 to 0.20 mg/L in surface waters and higher concentrations of 0.01 to 0.54 mg/L in bottom waters of the Mid-Atlantic Bight; dissolved inorganic phosphorus ranged from 0.02 to 0.06 mg/L at the surface and 0.02 to 0.12 mg/L in bottom waters. Also, in the Mid-Atlantic Bight, pH values of 8.0 to 8.6, and total suspended solid concentrations of 0.9 to 13.5 mg/L have been reported (Bathis et al. 2009).

3.5.2 Impact Level Definitions for Water Quality

This Final EIS uses a four-level classification scheme to analyze potential impact levels on water quality from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of 1 year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.5-4 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for water quality. Table G-4 in Appendix G (*Impact-Producing Factor Tables*) identifies potential IPFs, issues, and indicators to assess impacts to water quality.

Table 3.5-4. Definition of Potential Adverse and Beneficial Impact Levels for Water Quality

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	Impacts on water quality would be undetectable.	Impacts on water quality would be undetectable.
Minor	Impacts on water quality would be detectable but would not result in degradation of water quality in exceedance of standards. Impacts could be avoided with environmental protection measures (EPMs).	Small and measurable improvement in water quality.
Moderate	Impacts on water quality would be detectable and could result in localized, short-term degradation of water quality in exceedance of standards. Impacts could be minimized with EPMs.	Notable and measurable improvement in water quality.
Major	Impacts on water quality would be detectable and could result in extensive, long-term degradation of water quality in exceedance of standards.	Regional improvement in water quality.

3.5.3 Impacts of Alternative A - No Action on Water Quality

When analyzing the impacts of the No Action Alternative on water quality, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities, on the baseline condition for water quality. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.5.3.1 Impacts of the No Action Alternative

Under Alternative A, baseline water quality conditions would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore wind and offshore wind activities. Ongoing activities that could impact water quality in the GAA include onshore development (e.g., urbanization, wastewater or point source discharges, agriculture, forestry), land disturbance (e.g., construction), recreational activities, atmospheric deposition, discharges from marine vessels, dredging, port improvement, commercial fishing, military use, submarine cable and pipeline emplacement, terrestrial runoff, and climate change. Contaminated runoff or accidental releases into surface or groundwaters from these activities could cause exceedances of water quality standards; these impacts would be minimized or avoided through BMPs, state and federal regulations and permitting requirements. BOEM anticipates that impacts from these activities could be short-term to long-term depending on the nature and magnitude of the activities and could have a negligible to moderate impact on water quality.

Ongoing offshore wind activities within the GAA that contribute to impacts on water quality include:

- Continued O&M of the Block Island Project (5 WTGs) installed in state waters; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of the Block Island Project and ongoing construction of the Vineyard Wind 1 and South Forks projects would affect water quality through the primary IPFs of accidental releases, cable emplacement and maintenance, discharges, and port utilization. Ongoing offshore wind activities would have the same type of impacts from the IPFs that are described in following section for planned offshore wind activities.

3.5.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Other planned activities that could impact water quality in the GAA are onshore development, land disturbance, recreational activities, atmospheric deposition, discharges from marine vessels, dredging, port improvement, commercial fishing, military use, submarine cable and pipeline emplacement, terrestrial runoff, and climate change. These activities may result in short-term exceedances of water quality standards following a large accidental release, spill, or discharge or short-term increases in turbidity.

The sections below summarize the potential impacts of planned offshore wind activities on water quality during construction, O&M, and decommissioning of the projects. Future offshore wind activities other than the Proposed Action that may result in water quality impacts within the MA/RI Lease Area include New England Wind, South Coast Wind, South Fork Wind, Revolution Wind, Beacon Wind, Vineyard Northeast Wind, and Bay State Wind. The Revolution Wind, New England Wind, South Coast Wind, and Beacon Wind 1 Projects are expected to have overlapping construction schedules with the Proposed Action in 2024 and 2025. The GAA of the South Fork Wind, Revolution Wind, and Bay State Wind Projects overlap with the GAA of the Proposed Action. BOEM anticipates planned offshore wind activities would affect water quality through the following IPFs.

Accidental releases: Planned offshore wind activities may cause accidental releases of contaminants (e.g., oils, fuels, lubricants, coolants, solvents) to the ocean or to onshore waters from marine vessel use, on-vessel equipment, or onshore construction vehicles and equipment. Accidental spills could occur during transfer of fluids, refueling, construction, maintenance, collisions between vessels or with structures, or from large storms. Accidental releases would be short-term, localized to the area of the spill or leak, and be more likely to occur during the construction phase because of increased vessel traffic in ports and offshore construction areas. The probability of a vessel collision or allision is higher if the construction phases of planned offshore wind projects overlap which could occur between 2023 and 2030.

Approximately 629,637 gal of coolant fluids, 1,500,369 gal of oils and lubricants, and 485,427 gal of diesel fuel are estimated to be used in offshore wind projects in the GAA through 2030 (Appendix E). Other chemicals, including grease, paints, and SF_6, would be used at the offshore wind projects, and black and gray water may be stored in sump tanks on facilities. BOEM completed a modeling study to evaluate the likelihood of a chemical spill associated with routine O&M at offshore wind facilities (Bejarano et al. 2013). BOEM found that the risk of a catastrophic release (all oils totaling 129,000 gal [488,318 L] or all chemicals totaling 29,000 gal [109,777 L]) was very low (1 time in greater than or equal to 1,000 years) while small releases (several hundred gallons) were more likely. A small accidental release would have a minor to moderate impact on water quality because it would be short-term and localized to the area of the spill or leak. Future offshore wind projects would be required to comply with all regulatory requirements and permits and to develop an OSRP which requires a rapid spill response, containment, and cleanup for all onshore and offshore activities. A large, catastrophic spill would have short-term to long-term impacts depending on the type and volume of material spilled and impacts on water quality could be minor to major.

An accidental release of trash or debris would be infrequent because planned offshore wind projects would be required to comply with federal and international regulations regarding the management and disposal of trash. An accidental release of trash or debris would have a negligible impact on water quality.

Onshore construction and installation activities would involve the use of fuel and lubricating and hydraulic oils. Use of heavy equipment onshore could result in potential spills during active use or refueling activities. It is assumed that an SPCC Plan would be prepared for each project in accordance with applicable regulatory requirements and would outline spill prevention plans and measures to contain and clean up spills if they were to occur. Additional mitigation and minimization measures (such as refueling away from wetlands, waterbodies, or known private or community potable wells) would be in place to decrease impacts on water quality. Impacts on water quality would be limited to periods of onshore construction and periodic maintenance over the life of each project.

In summary, there is potential for moderate water quality impacts due to a maximum-case scenario accidental release; however, due to the very low likelihood of a maximum-case scenario release occurring, the expected size of the most likely spill to be small, and the expected occurrence to be of low frequency, the cumulative impact of accidental releases is anticipated to be short term, localized, and minor, resulting in little change to water quality. As such, accidental releases from offshore wind development in the water quality GAA would not be expected to contribute appreciably to cumulative impacts on water quality.

Anchoring: Anchoring during planned offshore wind activities would impact water quality through sediment suspension and deposition and increases in turbidity. Anchoring would occur during the construction and installation, O&M, and decommissioning phases of future offshore facilities. Anchoring is estimated to disturb 1,406 ac (6.1 km^2) of the seabed in the GAA. Impacts to water quality would be short-term and within and adjacent to the anchorage area. Impacts could be greater if anchoring activities from more than one project were occurring at the same time. However, due to the localized nature of the sediment plumes, impacts are not expected to overlap geographically. Impacts on water quality would be minor or moderate.

Cable emplacement and maintenance: The installation of offshore export cables is estimated to disturb 2,069 ac (8.4 km^2), and construction of the IAC is estimated to disturb 3,169 ac (12.8 km^2) of the seabed from future offshore wind activities in the GAA. The emplacement and maintenance of cables would result in increased turbidity from the suspension and deposition of sediment. Sediment transport modeling from cable installation completed for the Proposed Action estimated that sediment plumes would remain within approximately 9.8 ft (3 m) above the seabed, that turbidity levels would return to ambient levels within less than 1 hour, and that the maximum deposition would occur within less than approximately 1,000 ft (305 m) from the cable centerline (Woods Hole Group 2022). It is anticipated that future offshore wind projects would use cable emplacement methods that would be most likely to minimize impacts on water quality as much as feasible. Impacts on water quality from future offshore

wind activities would be minor or moderate, short-term, localized, and would not be expected to overlap geographically.

Discharges: Permitted discharges would be more likely during the construction and decommissioning phases of planned offshore wind projects and would be infrequent during O&M. During construction, there would be an incremental increase in vessel traffic near ports and in the offshore construction areas and a corresponding increase in regulated discharges (e.g., properly treated wastes, uncontaminated bilge water). All vessels would be required to comply with BMPs and state and federal regulatory requirements and permits related to the prevention and control of discharges.

Offshore wind project structures and facilities (e.g., WTGs, cables) are generally self-contained and do not generate discharges under normal operating conditions. Vessels have onboard containment plans and measures in place to avoid or minimize discharges. Due to the staggered increase in vessels from various projects; the current regulatory requirements administered by USEPA, USACE, USCG, and BSEE; and the restricted allowable discharges, the overall impact of discharges from vessels is anticipated to be short-term, localized, and staggered over time and would have a negligible or minor impact on water quality.

Offshore wind substations that use a high voltage direct current (HVDC) system to convert AC electricity to DC for long-range transmission may require a cooling system (Middleton and Barnhart 2022). The conversion of AC to DC generates a large amount of heat as a byproduct, and the HVDC system must be cooled when operating. The heated water is then discharged back to the ocean. Future offshore wind projects that use a HVDC system would be required to obtain a NPDES permit for the cooling system discharge. There may be a short-term, localized effect on water temperatures in the area surrounding the outlet pipe until the discharge water has mixed and reached equilibrium. It is generally accepted that the heated discharge water would have a minimal effect given the large mass of surrounding ocean and because it would be absorbed and cool to ambient water temperatures over time (Middleton and Barnhart 2022).

Land disturbance: The onshore construction associated with future offshore wind development could cause land disturbance from site preparation, clearing, grading, filling, and excavating which could introduce sediments or pollutants into coastal or surface waters in small amounts if erosion and sediment control measures were to fail. Land disturbance for offshore wind projects that are at a distance from waterbodies and that implement erosion and sediment control measures would be less likely to impact water quality. Construction and installation of onshore components near waterbodies may involve ground disturbance, which could lead to unvegetated or otherwise unstable soils. Precipitation events could potentially erode the soils, resulting in sedimentation of nearby surface or coastal waters and subsequent increased turbidity. Onshore construction activities would comply with all state and federal permits, erosion and sedimentation control plans, and SWPPPs which would minimize or avoid impacts on water quality. While onshore construction activities may occur at the same time, they likely would not overlap geographically. Any sedimentation into nearby waterbodies

following land disturbance would be short-term and localized and have a negligible or minor impact on water quality.

Port utilization: Planned offshore wind projects would use ports as staging areas, for material assembly and fabrication, crew transfer, and to support offshore construction and O&M. In-water work associated with port upgrades or expansion would increase vessel traffic and the risk of an accidental spill, leak, or discharge. Any required port upgrades or expansion would be completed in accordance with state and federal regulations and permits and would be completed in collaboration with multiple entities (e.g., port owners, governmental agencies, states, other offshore wind developers). Impacts on water quality from port utilization would be minor or moderate, short-term, and localized.

Presence of structures: Planned offshore wind activities could result in the installation of up to 1,038 WTGs and approximately 23 converter stations in the MA/RI Lease Area, and 238 WTGs in the water quality GAA. In the MA/RI Lease Area, the total footprint from foundations with the addition of scour protection is estimated to be 3,222 ac (1,304 km^2); 211 ac (0.8 km^2) would be within the water quality GAA.

Offshore wind facilities have the potential to impact atmospheric and oceanographic processes through the presence of structures and the extraction of energy from the wind. The presence of offshore wind turbines has been shown to alter the vertical and horizontal mixing patterns of ocean waters which could influence water quality (e.g., water temperature, nutrients, DO, turbidity) by changing the thermal stratification and mixing between the surface and deep waters (e.g., Carpenter et al. 2016; Cazenave et al. 2016; Schultze et al. 2020; Johnson et al. 2021). The range of potential impacts include increased mixing and turbulence downstream, remobilization of sediments, reduced flow inside wind farms, downstream changes in stratification, redistribution of water temperature, and changes in nutrient upwelling and primary productivity (Van Berkel et al. 2020). Human-made structures, especially tall vertical structures such as foundations, alter local water flow at a fine scale by potentially reducing wind-driven mixing of surface waters or increasing vertical mixing as water flows around the structure (Carpenter et al. 2016; Cazenave et al. 2016; Schultze et al. 2020). Alterations in currents and mixing would affect water quality parameters such as temperature, DO, and salinity, but would vary seasonally and very site-specific. For instance, a modeling study of the North Sea found that a simulated offshore wind farm had small impact on DO levels with lower DO in a bathymetric depression and higher DO in more shallow areas (Daewel et al. 2022).

Most studies of the influence of offshore wind turbines on hydrodynamics within a wind farm conducted to date have focused on ocean modeling rather than field measurement campaigns. Further, the general understanding of offshore wind-related impacts on hydrodynamics and water quality is derived primarily from European based studies making it challenging to apply those results to the local and regional physical oceanographic processes and conditions of the Mid-Atlantic Bight and the RI/MA Lease Area.

Hydrodynamic disturbance resulting from the broadscale development of large offshore wind farms is a topic of emerging concern because of potential effects on the Mid-Atlantic Bight cold pool (e.g., Chen et al. 2016; Lentz 2017). Results from a recent hydrodynamic model of four different WTG build-out scenarios of the offshore RI/MA Lease Areas found that offshore wind projects have the potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification) via their influence on currents from WTG foundations and by extracting energy from the wind (Johnson et al. 2021). The results of the hydrodynamic model study show that introduction of the offshore wind structures into the offshore WEA modifies the oceanic responses of current magnitude, temperature, and wave heights by (1) reducing the current magnitude through added flow resistance, (2) influencing the temperature stratification by introducing additional mixing, and (3) reducing current magnitude and wave height by extracting of energy from the wind by the offshore wind turbines. The additional mixing downstream the turbines would serve to reduce thermal stratification and mix bottom and surface waters. BOEM also conducted a model study offshore Rhode Island and Massachusetts that evaluated ocean processes during two extreme weather events: the February 1978 Nor'easter (a 100-year storm) and the August 1991 Hurricane Bob (Chen et al. 2016). The results indicated that the wind turbine facility on the eastern shelf of Block Island, Rhode Island would cause more significant local and regional impacts than offshore wind facilities over the outer shelves off Massachusetts and Rhode Island. The model found that the influence of the deployment of a wind turbine facility had a significant spatially variable pattern and had a regional impact during both storm types.

The potential influence of offshore wind turbines on hydrodynamic processes and water quality has been shown to depend upon the strength of the local stratification pattern and the local tidal regime. Van Berkel et al. (2020) and Schultze et al. (2020) noted that environments characterized by strong seasonal stratification are likely to be less sensitive to wind field and turbulent mixing effects of turbines on oceanographic processes. The SRWF and surroundings are characterized by strong seasonal stratification in summer and fall, with increased mixing and deterioration of stratification driven by storms and changes in upwelling in late fall into winter (Chen et al. 2016; Lentz 2017). On the Mid-Atlantic Bight, increased mixing could influence the strength and persistence of the cold pool while also serving to redistribute DO and nutrients. However, the turbulence introduced by monopile foundations is not expected to significantly affect the cold pool due to the strength of the stratification (temperature differences between the surface and the cold pool reach 50°F [10°C] [Lentz 2017]). In strongly stratified locations, the mixing seen at monopiles is often masked by processes forcing toward stratification (Schultze et al. 2020). The introduction of nutrients from depth into the surface mixed layer can also lead to a local increase in primary production (Floeter et al. 2017; refer to Section 3.5.5, *Finfish, Invertebrates, and Essential Fish Habitat*, Section 3.5.6, *Marine Mammals*, and Section 3.5.7, *Sea Turtles*, regarding hydrodynamic and atmospheric wake effects on primary production). Furthermore, Christiansen et al. (2022) discussed the importance of tides on the potential impacts of wake effects on hydrodynamics and suggested that hydrodynamic processes in a tidally dominated regime may only be half as strong as regions not tidally dominated due to tidal currents deflecting wind-induced processes.

The exposure of offshore wind structures, which are mainly made of steel, to the marine environment can result in corrosion without protective measures. Corrosion is a general problem for offshore infrastructures and corrosion protection systems are necessary to maintain the structural integrity. Protective measures for corrosion (e.g., coatings, cathodic protection systems) are often in direct contact with seawater and have different potentials for emissions (e.g., galvanic anodes emitting metals, such as aluminum, zinc, and indium, and organic coatings releasing organic compounds due to weathering and leaching). The current understanding of chemical emissions for offshore wind structures is that emissions appear to be low or not distinguishable from background levels, suggesting a low environmental impact, especially if compared to other offshore activities. However, chemical emissions may become more relevant for the marine environment with increased numbers of offshore wind projects and a better understanding of the potential long-term effects of corrosion protection systems (Kirchgeorg et al. 2018; BSH and Hereon 2022). Based on the current understanding of offshore wind structure corrosion effects on water quality, BOEM anticipates the potential impact to be minor; this area is currently under investigation.

3.5.3.3 Conclusions

Impacts of the No Action Alternative

Under Alternative A, the No Action Alternative, baseline water quality conditions would continue to be affected by existing environmental trends and ongoing activities and to be impacted by existing sources (e.g., runoff, industrial or municipal point sources, atmospheric deposition, agriculture, marine vessel traffic, dredging, coastal road construction, recreation and tourism, harbor and port operations). Ongoing activities include vessel traffic, military activities, onshore development and land disturbance, port development, commercial and industrial activities, recreational activities, and installation of new offshore structures. While water quality impacts would be temporary and localized, and regulatory and permitting requirements minimize these impacts, issues with water quality may still occur. Accidental releases or discharges, anchoring, cable emplacement and maintenance, port utilization, presence of structures, or land/seafloor disturbance would each have negligible to moderate short-term impacts on water quality. Overall, the No Action Alternative would have a **minor** adverse impact on water quality.

Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, existing environmental trends and ongoing activities would continue. Planned offshore wind projects are anticipated to have negligible to moderate adverse impacts on water quality through anchoring; cable installation/maintenance; port utilization; presence of structures; discharges; and land or seafloor disturbance. These IPFs could result in short-term exceedances of water quality standards. Future offshore wind projects may result in a small increase in vessel traffic, particularly during the construction and decommissioning phases, with corresponding potential impacts on water quality. Increased vessel traffic would be localized to the ports, transit routes, and offshore construction areas. Construction and decommissioning activities associated with other offshore wind activities would lead to increases in sediment suspension and turbidity in the offshore lease areas during

the first 6 to 10 years of construction of projects and in the latter part of the 30-year life spans of offshore wind projects due to decommissioning activities. Runoff into surface waters or ground waters could result in exceedances of water quality standards that can affect the beneficial uses of the water. BOEM has considered the possibility of impacts resulting from accidental releases; a moderate or major impact could occur if there was a large-volume, catastrophic release or spill. However, the probability of catastrophic release occurring is very low, the expected size of the most likely spill would be very small, and such a spill would be expected to occur infrequently.

The potential impacts on water quality from planned activities would be avoided or minimized through state and federal regulations and any development would comply with all permit requirements (e.g., implementation of BMPs, OSRP, Erosion and Sedimentation Control Plan, and SWPPP). Considering all the IPFs together, BOEM anticipates the overall potential cumulative impacts on water quality associated with planned offshore wind activity would be **minor** adverse.

3.5.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than those described in the sections below. The primary proposed PDE parameters (Appendix C) that would influence the magnitude of the impact on water quality include the following:

- The number, capacity, and location of WTGs: the level of impact related to the WTGs is proportional to the number of WTGs installed and the amount of seabed disturbed;
- The amount of vessel use during construction/installation, O&M, and decommissioning: the number of vessels used influences the potential risk of fuel or chemical spills or releases;
- The length of the IAC and export cables: the amount of cable installed influences the amount of seafloor disturbed and sediment mobilized;
- Sediment type influences the amount of sedimentation, deposition, and disturbance;
- Offshore and onshore cable installation and laying methods;
- Different routes for the OTC: the use of different routes influences the potential water bodies crossed by the cable; and
- Quantity and type of oil, lubricants, or other chemicals contained in the equipment, vessels, and WTG.

Variability of the proposed Project design as a result of the PDE includes the number of WTGs (influences number of foundation), capacity of WTGs (influences size of foundation), length of cables (influences volume of seabed disturbed), area of scour protection (influences amount of sedimentation and deposition), number and frequency of vessel use. Changes in design may affect the magnitude, location, and mechanism of water quality impacts.

3.5.5 Impacts of Alternative B - Proposed Action on Water Quality

The sections below summarize the potential impacts of the Proposed Action on water quality during the various phases of the Proposed Action. Routine activities would include construction, O&M, and decommissioning of the Project, as described in Chapter 2, Section 2.1.2 *Alternative B – Proposed Action.* Construction, O&M, and decommissioning activities associated with the Proposed Action would contribute to impacts on water quality from accidental releases and discharges, anchoring, cable emplacement and maintenance, land disturbance, port utilization, and presence of structures.

3.5.5.1 Construction and Installation

3.5.5.1.1 Onshore Activities and Facilities

Accidental release: Accidental release of fuels, oils, solvents, lubricants, drilling, or hydraulic fluids to surface, ground, or coastal waters could occur from construction vehicles, heavy equipment, HDD activities, and refueling during construction and installation of the onshore Project components. The likelihood of a large oil or chemical spill is low, and the magnitude of the impact would depend on the spill volume. However, a direct spill into a water body could degrade water quality. Any impact on surface, coastal, or ground water quality, including the Nassau/Suffolk Long Island Sole Source Aquifer, would be avoided or minimized through implementation of BMPs, development and implementation of an SWPPP and an SPCC Plan (APM GEN-20, GEN-21, WQ-01), and EPMs described in COP Section 4.3.3.3 (Sunrise Wind 2023). An Inadvertent Return Plan would be developed and implemented to avoid or minimize the accidental release of drilling fluid during HDD for installation of the onshore transmission cable (APM GEN-22). The Sunrise Wind EM&CP includes the specific plans referenced above.

Good housekeeping and proper waste collection, storage, and disposal techniques would be implemented to minimize impacts on water quality from trash and debris. All trash and debris created during onshore construction and installation activities would be properly disposed of or recycled at licensed waste management and recycling facilities (APM GEN-19).

Environmental protection and mitigation measures from applicable federal and state permits would be followed which would minimize impacts on water quality. Construction of the onshore facilities is expected to be completed within 2 years and any impacts on water quality would cease after construction is complete. Potential impacts on water quality are anticipated to be localized and short-term and minor or moderate.

Anchoring: There would be no impacts on water quality during the construction and installation of onshore facilities from anchoring.

Cable emplacement and maintenance: Construction and installation of the onshore cables could impact water quality through increased sedimentation and turbidity. Cable emplacement would be conducted using trenchless methods to minimize or avoid impacts on water quality and in accordance with the

erosion and sedimentation control plan and SWPPP. Potential impacts to water quality are anticipated to be localized and short-term and negligible to minor.

Dewatering may be necessary to remove ground water and stormwater from open excavations to facilitate excavation activities in areas of shallow groundwater. Some of the dewatering locations may be within or adjacent to the Carmans River 100-Year Groundwater Contributing Area (Dewatering Plan). In the vicinity of the Carmans River, the groundwater is expected to be located from 6 to 14 ft (1.8 to 4.3 m) below grade surface. The majority of trenching activity is not expected to exceed 5 ft (1.5 m); thus, impacts to groundwater are anticipated to be negligible. Onshore activities associated with the SRWF would not be anticipated to interfere with implementation of the Carmans River Conservation and Management Plan and the protection of water quality in the Carmans River (Town of Brookhaven 2013).

Discharges: Onshore construction activities would produce waste (e.g., solid waste, chemicals, oils, solvents, sewage) that would be properly controlled, stored, and disposed of in accordance with state and federal permits. The OnCS-DC, onshore interconnection cable, and onshore transmission cable would be self-contained and would not generate discharges. Discharges would be more likely during the onshore construction phase because of the increased vehicle and equipment use. Impacts on water quality would be negligible or minor.

Seafloor/Land disturbance: Construction of the onshore facilities would require short-term ground-disturbing activities, such as clearing, grading, excavating, trenching, and HDD at the landfall work area, during TJB and HDD installation, installation of the onshore interconnection cable and OTC, and construction of the OnCS-DC. Land disturbance activities would impact the water quality of surface, ground (i.e., the Nassau/Suffolk Long Island Sole Source Aquifer), or coastal waters (e.g., shoreline of Smith Point County Park, Fire Island) through erosion, sedimentation, deposition, resuspension of contaminated sediment, and increased turbidity if control measures were to fail. Impacts on water quality from land disturbance would be more likely during the construction phase.

Land disturbance during onshore construction would be minimized by installing facilities in areas that have been previously disturbed or developed (APM GEN-01). Sunrise Wind selected locations for the OnCS-DC, landfall site, and transmission route that would minimize land disturbances. A maximum area of 7.0 ac (2.8 hectares [ha]) would be disturbed for construction of the OnCS-DC; land disturbance near the OnCS-DC would be minimal because the site is near other industrial and commercial developments and contains minimal vegetated areas (COP Section 2.2.1.1, Sunrise Wind 2023). Smith Point County Park was chosen as the proposed landfall site because it has sufficient workspace within a developed area and minimal conflicts with adjacent land uses. HDD activities would be used to install the SRWEC to the TJB and the onshore transmission cable which would minimize land disturbance. The onshore interconnection cable and proposed onshore transmission route is primarily within an existing right-of-way and near paved, disturbed areas which would confine any disturbance to the construction areas. The disturbance would cease after the cable installation has been completed. Areas disturbed for the short-term creation of construction work areas would be returned to pre-existing conditions.

Sediment suspension and deposition to the ICW and Carmans River could occur during construction and installation of the OTC. The maximum lengths of the ICW and Carmans River that would be crossed are 2,222 ft (667 m) and 2,177 ft (664 m), respectively (COP Section 3.3.2.3, Sunrise Wind 2023). The ICW and Carmans River would be crossed using trenchless installation methods (i.e., HDD) to avoid or minimize impacts to water quality. An Inadvertent Return Plan would be developed and implemented to avoid or minimize the accidental release of drilling fluid during HDD for installation of the onshore transmission cable (APM GEN-22). All land disturbance activities during onshore construction would be conducted in compliance with federal permits (Section 404, Section 401 Water Quality Certification), the NYS Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges associated with construction activities, an approved SWPPP, and EPMs described in Section 4.3.3.3 of the COP (Sunrise Wind 2023) at a minimum; a draft WQC for the Project was issued in August 2023. These measures would serve to protect the Smith Point County Park and Fire Island Wilderness Areas. Construction of all onshore facilities is expected to be completed within 2 years. Potential impacts to water quality would be localized and short-term and cease after construction is completed. Impacts on water quality from land disturbance would be minor or moderate.

Port utilization: Multiple ports are being considered for use during the construction phase. In-water work associated with port upgrades or expansion would increase vessel traffic and the risk of an accidental spill, leak, or discharge. Any required port upgrades or expansion would be completed in accordance with state and federal regulations and permits and would be completed in collaboration with multiple entities (e.g., port owners, governmental agencies, states, other offshore wind developers). Impacts on water quality from port utilization would be minor or moderate, short-term, and localized.

Presence of structures: The presence of structures in coastal waters would not likely impact water quality. An impact could occur if a vessel collides with a structure causing an accidental chemical spill or leak. However, the risk of this is low and any spill would be quickly contained and cleaned. A collision is more likely during the construction phase because of the increased vessel traffic. The impacts of the Proposed Action on onshore water quality due to the presence of structures would be negligible.

3.5.5.1.2 Offshore Activities and Facilities

Accidental releases: Fuels, oils, solvents, and chemicals would be used during construction of the offshore facilities and would be stored on the WTGs and OCS. Approximately 336,004 gal of coolants, 318,250 gal of oils and lubricants, and 24,304 gal of diesel fuel are estimated to be used for the Proposed Action. BOEM has conducted modeling to evaluate the likelihood of a chemical spill at offshore wind facilities at three locations along the Atlantic coast, including an area in the Rhode Island/Massachusetts lease area with a similar number of WTGs (98) as the Proposed Action (Bejarano et al. 2013). Results of the model found that the likelihood of a catastrophic, or maximum-case scenario, release of 129,000 gal of oil mixture was 'Very Low' meaning it could occur one time in 1,000 or more years. The most likely type of spills to occur were from the WTGs at a volume of 90 to 440 gal at a rate of one time in 5 years or a diesel fuel spill of up to 2,000 gal at a rate of one time in 91 years (Bejarano

et al. 2013). Overall, the risk of an accidental spill or leak is low but more likely during the construction phase because of the increased vessel traffic and equipment use. However, this would be unlikely because of safety measures such as requirements for vessel lighting and marking, vessel speed restrictions, and spacing of facilities (APM GEN-08, GEN-15, GEN-23). Overall, the probability of an oil or chemical spill occurring that would be large enough to affect water quality is low, and the degree of impact on water quality would depend on the spill volume. If a large spill were to occur (e.g., 129,000 gal, Bejarano et al. 2013), impacts would be short-term to long-term depending on the volume and type of material released. Overall, impacts on water quality from spills and leaks would be short-term and minor to moderate because construction activities would comply with state and federal regulations and impacts would only occur during accidental events (WQ-01). Sunrise Wind would follow all BMPs, an OSRP, and other mitigation measures described in Section 4.3.3.3 of the COP (Sunrise Wind 2023) at a minimum.

The release of contaminants within sediments due to sediment resuspension and deposition is expected to be minor because there are no USEPA-designated ocean disposal sites overlapping or immediately adjacent to the SRWF (USEPA 2021b). Impacts on water quality from resuspension of contaminated sediments would be negligible or minor.

Adverse impacts to waters within the Fire Island National Seashore and nearshore waters would be avoided and minimized through compliance with multiple mitigation plans submitted in the EM&CP, including a Dewatering Plan, Materials Management Plan, Wetland Monitoring and Impact Minimization Plan, OSRP, SPCC Plan, SWPPP, and the Certificate of Environmental Compatibility and Public Need Conditions. SRW would use a transport barge to move material across the ICW to the temporary Landing Structure that would be installed in Narrow Bay. Vessels traveling across the ICW pose a risk for accidental releases. All vessels would be required to comply with USEPA and USCG, and BOEM pollution prevention measures and storage and disposal regulations. The Onshore SPCC and Offshore SPCC plans describe the storage, handling, transportation, and disposal of oil, fuels, petroleum, chemicals or other potentially hazardous or harmful substances, the measures that would be taken to avoid spills, and the procedures for responding, reporting, and remediating any spills.

Sunrise Wind would follow all BOEM and USCG regulations and good housekeeping practices related to the storage and disposal of all trash and debris created during construction and installation of the offshore components. All trash and debris would be properly stored on vessels for disposal or recycling at an appropriate facility on land. Sunrise Wind would follow BMPs including orderly storage of equipment and tools and keeping work areas clean. The disposal of trash and debris to the marine environment is prohibited, and thus unlikely to occur (BOEM 2013). The potential impact of trash and debris on water quality is negligible or minor.

Anchoring: Construction of the offshore facilities would require anchoring of vessels to the seabed which would cause increased sedimentation, deposition, and turbidity. Anchoring could disturb the seabed through penetration of the anchors, dragging of anchors, or the sweeping of chains. The extent and magnitude of impacts from anchoring would depend on the type and size of anchoring used, vessel

drag distance, and the sediment characteristics. Approximately 260 ac (1.1 km^2) of seabed is expected to be disturbed due to anchoring from the Proposed Project alone, and 1,204 ac (4.9 km^2) of seabed disturbance with existing and ongoing projects (Appendix E). Impacts on water quality from anchoring would be minor.

Cable emplacement and maintenance: All of the potential cable installation techniques (e.g., jet plowing, mechanical plowing, mechanical cutting, dredging, backfill plowing) would disturb the seafloor. Site preparation activities, such as sand wave clearance and boulder removal, would be required prior to cable installation. Cable emplacement would cause sediment suspension and deposition and increased turbidity; however, the impacts would be short-term and minor. SRW has developed a Suspended Sediment and Water Quality Monitoring Plan for activities associated with the SRWEC-NYS which specifies monitoring requirements for various construction activities (e.g., jet trenching, HDD exit pit excavation, sand wave leveling, cable installation) and total suspended sediment (TSS) limits (APM WQ-02). Further, conditions 9 to 11 of the draft WQC (issued August 2023) describe water quality monitoring requirements.

Hydrodynamic and sediment transport modeling was completed to estimate suspended sediment and deposition levels from construction activities associated with excavation of an HDD exit pit, installation of the IAC, SRWEC-OCS, SRWEC-NYS, and sand wave leveling for seafloor preparation using controlled flow excavation (CFE) and a trailing suction hopper dredge (TSHD) in federal waters (Woods Hole Group 2022). In the model, turbidity levels were represented as TSS, and deposition was represented as thickness above seafloor.

Sediment deposition after HDD exit pit excavation in NYS waters was modeled using a clamshell bucket and using an open bucket. The open bucket method was estimated to produce a higher maximum TSS concentration (greater than 100 mg/L); using a clamshell bucket, TSS concentrations over 100 mg/L did not occur. The area with a deposition thickness greater than 10 mm extended farther from the source using the open bucket method. Using both excavation methods, TSS concentrations were estimated to return to ambient levels within 0.3 hours. For these two scenarios, the excavated material would be transferred through the water column to be stored on a barge. Another option being considered by SRW is to store the sediment on the seafloor next to the excavated pit which would result in lower TSS concentrations; however, sediment mobilization could occur during storm (e.g., high wind) events. Modeling results suggested that nearly all (95 percent) mobilized sediment remained within 500 ft (152 m) of the initial placement site (Woods Hole Group 2022).

Installation of the SRWEC-NYS using HDD was not modeled to produce TSS concentrations above 100 mg/L. The TSS plume was predicted to remain within 8.2 ft (2.5 m) above the seafloor, and TSS concentrations were predicted to return to ambient levels within 0.3 hour after completing installation. For installation of the SRWEC-OCS, the TSS plume was predicted to remain within approximately 9.8 ft (3 m) above the seafloor with maximum concentrations (greater than 100 mg/L) occurring within 2,969 ft (905 m) of the cable centerline. TSS was predicted to return to ambient levels within 0.4 hours. Sedimentation levels above 0.4 inch (10 mm) extended to 791 ft (241 m) from the cable centerline and

covered 832.3 ac (3.4 km^2). Sand wave leveling along the SRWEC-OCS would be required using either CFE or TSHD. The TSHD method was modeled to produce lower peak TSS concentrations and higher deposition thicknesses.

For installation of the IAC, modeling was completed for a typical and worst-case scenario (i.e., using jet plowing). Results showed that maximum TSS concentrations (greater than 100 mg/L) occur within 2,031 ft (619 m) to 3,346 ft (1,020 m) of the cable centerline (Woods Hole Group 2022). The plume remained primarily within approximately 9.5 ft to 12.8 ft (2.9 m to 3.9 m) above the seafloor. TSS levels were estimated to return to ambient levels within 0.4 hour to 0.5 hour after completion of installation.

Overall, the sediment transport modeling estimated that sediment plumes would quickly settle to the seabed (less than 1 hour) and would be limited to within 9.8 ft to 13.1 ft (3 m to 4 m) above the seabed. Impacts on water quality from cable emplacement would be short-term, localized, and minor.

Discharges: Discharges of chemicals, sewage, or wastewater (e.g., domestic water, deck drainage, uncontaminated ballast and bilge water) from marine vessels used during offshore construction may occur. All marine vessels used during construction would be required to comply with international, federal, and state regulations and standards for the management, storage, treatment, and disposal of solid and liquid wastes. All vessel operators would be trained and licensed. All solid and liquid wastes would be properly treated and disposed of at appropriate waste receiving sites on land.

The discharge of bilge water, ballast water, and domestic water is permitted (BOEM 2013; 33 *CFR* 151.10). These wastes are expected to quickly disperse, dilute, and biodegrade (BOEM 2013); thus, these regulated discharges would be expected to have minor, local, and short-term impacts. Sunrise Wind would follow all BMPs and the Emergency Response Plan/OSRP and other mitigation measures described in Section 4.3.3.3 of the COP (Sunrise Wind 2023) at a minimum.

Seafloor/Land disturbance: Offshore construction activities would cause short-term seafloor disturbance. Installation of the WTG foundations and OCS-DC, anchoring, seafloor preparation (e.g., sand wave leveling, boulder relocation), and cable installation would cause short-term, localized increases in sediment suspension, deposition, and turbidity levels. The maximum estimated area of seafloor disturbance during construction of the WTG foundations is 3,835 ac (15.5 km^2); OCS-DC is 37.6 ac (0.15 km^2), IAC is 2,150 ac (8.7 km^2), SRWEC-OCS is 1,185 ac (4.8 km^2), and of the SRWEC-NYS is 74 ac (0.3 km^2) (COP Section 3.3.5.2, 3.3.7.2, 3.3.3.5, Sunrise Wind 2023). Disturbance from cable laying would be confined to a narrow region around the cable trench. Construction of the offshore components is expected to be completed within 18 months. Seafloor disturbance would be short-term and cease after construction is complete. Impacts on water quality would be negligible or minor and would be minimized or avoided through use of BMPs and other mitigation measures described in Section 4.3.3.3 of the COP (Sunrise Wind 2023) at a minimum.

Port utilization: Several ports are being considered to support the offshore construction phase. The short-term increase in vessel traffic during construction may increase the likelihood of an accidental

release or discharge or sedimentation. Impacts on water quality would be negligible or minor, short-term and localized and minimized through implementation of BMPs and measures described in Section 4.3.3.3 of the COP (Sunrise Wind 2023) at a minimum.

Presence of structures: There are currently no existing stationary facilities or structures within the Lease Area; therefore, there is currently no risk of an allision or collision. After the WTGs and OCS-DC are constructed, the potential risk of collision or allision would be low and an accidental release or discharge would be unlikely because of the reasons discussed above in the *accidental releases* section. The presence of structures is known to alter the vertical and horizontal mixing patterns of ocean waters which could influence water quality (e.g., water temperature, salinity, DO, turbidity) by changing the thermal stratification and mixing between surface and deep waters (e.g., Carpenter et al. 2016; Cazenave et al. 2016; Schultze et al. 2020); however, the potential influence on hydrodynamic processes in the Mid-Atlantic Bight is not well studied. See Section 3.5.3.2 for additional discussion of the potential influence of structures on hydrodynamics. Impacts on water quality from the installation of structures would be minimized through implementation of BMPs and compliance with permits and would be negligible or minor.

3.5.5.2 Operations and Maintenance

3.5.5.2.1 Onshore Activities and Facilities

Accidental releases: Operation of the OnCS-DC would require the storage and use of oils, fuels, and lubricants. A maximum of 101,333 gal (347,918 L) of oils, fuels, and lubricants could be used to operate the OnCS-DC. Passenger vehicles and heavy equipment used during maintenance activities (e.g., equipment testing, routine repairs, vegetation clearing) could infrequently result in the accidental release of fuels or oils during use or refueling. The onshore transmission cable would not contain any chemicals or fuels and would not be susceptible to leaks. Operation and preventative maintenance activities would be completed in accordance with an O&M Plan. Implementation of the SPCC Plan (APM GEN-21), as well as EPMs described in Section 4.3.3.3 of the COP (Sunrise Wind 2023), would prevent or minimize the accidental release of fuels, oils, or lubricants to onshore waters and would contain measures for containment and clean up. Fewer vehicles and equipment would be used during the O&M phase and impacts on water quality would be less likely than during construction. Impacts to water quality due to an inadvertent release would be short-term and localized.

Trash and debris may be generated during O&M activities; the amount of trash and debris would be less than during the construction phase. Good housekeeping and proper waste management methods would minimize or avoid the introduction of trash and debris to onshore waters (APM GEN-19). Potential impacts to onshore water quality would be minor.

Anchoring: There would be no impacts on water quality during O&M activities at onshore facilities from anchoring.

Cable emplacement and maintenance: Impacts on water quality due to cable emplacement and maintenance would be minimal and would only occur if non-routine maintenance or repair activities were needed for the onshore interconnection cable or OTC. Sediment suspension or deposition could occur if there is a fault or failure of an onshore cable in or near the ICW or Carmans River that requires repair. If sediment disturbance is necessary, EPMs and permit requirements would be followed. The SWPPP would include erosion and sedimentation controls to prevent or minimize the introduction of sediment to onshore waters. Potential impacts to water quality would be minor and short-term and less than those that may occur during the construction phase.

Discharges: Operation of the OnCS-DC would require the use of oils, fuels, and lubricants and maintenance vehicles would use engine fuel. Implementation of the SPCC Plan would prevent or minimize the accidental discharge of chemicals or fuels. Impacts to water quality due to an inadvertent discharge would be minor, short-term, and localized.

Seafloor/Land disturbance: Land disturbance due to O&M activities at the onshore facilities is expected to be minimal. Land disturbance could occur if a repair or replacement is needed that would require re-excavation along the cable. Potential impacts to water quality from land disturbance would be less frequent than during the construction phase.

Port utilization: Several ports are being considered to support O&M activities. Port utilization for onshore O&M would have a negligible or minor impact on water quality.

Presence of structures: The presence of structures in coastal waters, such as docks and piers, would not likely impact water quality during onshore O&M activities. An impact could occur if a vessel collides with a structure causing an accidental chemical spill or leak. Vessel traffic would be less than during the construction phase, and the risk of a collision or allision is low. Any spill or discharge would be quickly contained and cleaned. The impacts of the Proposed Action on onshore water quality due to the presence of structures would be negligible.

3.5.5.2.2 Offshore Activities and Facilities

Accidental releases: During the offshore O&M phase, impacts on water quality from accidental releases could occur during periodic vessel use for regular inspections and maintenance practices and from on-vessel equipment used for repairs or maintenance. Routine inspections of electrical components and minor corrective and preventative maintenance actions would occur multiple times per year (COP Section 3.5.2, Sunrise Wind 2023). Annual maintenance activities would include above water and visual inspections, routine service and safety checks, and oil and high-voltage maintenance (COP Section 3.5.4, Sunrise Wind 2023). Non-routine (e.g., corrective and major repairs) maintenance would occur as needed. Accidental releases during the O&M phase would be less likely than during the construction phase because there would be fewer vessels.

Oils, gases, lubricants, and fuels would be used at the OCS-DC in transformers and reactors, fuel tanks, cranes, rotating equipment, pumps, generators, and chilling/cooling units. Each of the WTGs would require oils, fuels, and lubricants for the bearings, accumulators, pumps, actuators, gearbox, transformer, and cooling system. There is a low risk of an accidental release from a diesel generator because they would only be used during emergencies, planned maintenance shutdowns, and testing periods. Approximately 203,916 gal of oils, fuels, gases, and lubricants are currently estimated to be used for the OCS-DC (COP Table 3.3.6-2, Sunrise Wind 2023), and a maximum of 6,551 gal of oils, lubricants, and gas may be stored on each WTG (COP Table 3.3.8-2, Sunrise Wind 2023). Impacts on offshore water quality would be avoided or minimized through measures to contain accidental releases at the WTGs including 100 percent leakage-free joints, high pressure sensors, oil level sensors to detect leakages, and retention reservoirs that could contain 110 percent of the volume of any potential leaks (COP Section 3.3.8.1, Sunrise Wind 2023). Accidental release avoidance and minimization measures for the OCS-DC include a minimum of 110 percent secondary containment of all oils, greases, and lubricants, gas density monitoring devices to detect leaks, and not storing chemicals on the platform (COP Section 3.3.6.1, Sunrise Wind 2023). Sunrise Wind would follow all BMPs and the Emergency Response Plan/OSRP and other mitigation measures described in Section 4.3.3.3 of the COP (APM GEN-11, Sunrise Wind 2023) at a minimum. The potential impact on water quality from an accidental release would be minor or moderate.

Impacts to water quality from trash and debris during the O&M phase are expected to be similar to, but less likely, than during the construction and installation phase because there would be fewer marine vessels used. All regulatory requirements would still apply. Best management and good housekeeping practices would be implemented to minimize or avoid the potential accidental disposal of trash or debris to the ocean.

Anchoring: There would be a minimal impact on water quality due to anchoring during offshore O&M activities because there would be fewer vessels required. Vessel anchoring could be necessary for repairs or maintenance and only for vessels that would need to be onsite for an extended period. This would be infrequent over the 25- to 35-year operational life of the proposed Project. Impacts on water quality would be negligible or minor.

Cable emplacement and maintenance: The IAC and SRWEC are not expected to have maintenance requirements unless a fault or failure requiring repair were to occur, which would be infrequent. Also, it is expected that only a minor amount of cable protection would need to be replaced over the 25-to-35-year lifetime of the Project. Non-routine maintenance and repair activity would impact water quality through sediment suspension, deposition, and increased turbidity. Impacts on water quality through cable emplacement and maintenance during offshore O&M activities over the lifetime of the Project would be short-term, less than during the construction phase, and minor.

Discharges: Impacts to water quality from discharges and releases during the O&M phase are expected to be similar to, but less likely, than during the construction and installation phase because there would be fewer marine vessels used. The estimated amount of solid and liquid wastes generated during 1-year

of offshore operations is 1,056 cy (807 cubic meters [m^3]) compared to 13,833 cy (10,576 m^3) generated during offshore construction (COP Table 3.3.10-4, Table 3.5.6-1, Sunrise Wind 2023). All international, federal, and state regulations regarding the management, storage, and disposal of wastes would still apply during O&M activities. Unpermitted, accidental discharges would be unlikely to occur, and any impact would be short-term and localized.

Operation of the OCS-DC would require the continuous withdrawal and discharge of non-contact cooling water. The daily design intake flow (DIF) for the OCS-DC would be 8.1 mgd, and the daily average intake flow would range from 4.0 to 5.3 mgd. The maximum daily average discharge temperature would be 90°F, and the daily average discharge temperature would be 86°F (TRC 2021). The vertical discharge pipe would be oriented downward in the water column, and the thermal effluent would be discharged at a depth of 40 ft (12 m) below local mean sea level (MSL). Hydrothermal modeling determined that this represented the optimal depth for discharge of the heated effluent because rapid and complete mixing would occur and would prevent the thermal plume from migrating to the surface or benthos (TRC 2021). The thermal plume would be contained within 87 ft (26.5 m) of the discharge point and occupy a maximum area of 731 square feet (ft^2; 67.9 square meters [m^2]) under a worst-case scenario. Further, modeling demonstrated that discharge at this depth would not impact water quality beyond the regulatory mixing zone of 330 ft (100 m) from the point of discharge.

The cooling water intake system (CWIS) would contain an electrochlorination system that would produce chlorinated seawater to prevent biofouling within the system (TRC 2021). The chlorinated seawater would be taken up with raw seawater and directed through the Heat Exchange System and the Dump Caisson. The chlorine concentration that would be added would range from 0.5 ppm up to 2 ppm during infrequent shock dosing. The amount of chlorine added to the seawater would be automatically adjusted so that the chlorine would be completely consumed by potential biofouling organisms within the system to minimize or eliminate the release of hypochlorite through the Dump Caisson. Thus, the release of hypochlorite to the seawater is unlikely to occur.

Sunrise Wind submitted an NPDES permit application to the USEPA in December 2021 for the discharge of water from the OCS-DC (TRC 2021) and obtained a draft NPDES permit (Number MA0004940) in May 2023. Federal water quality criteria and ocean discharge criteria apply to the Proposed Action because it is located in federal waters. Section 316(b) of the CWA requires that NPDES permits for facilities with CWIS ensure that the location, design, capacity, and construction use the best technology available to minimize effects on the environment. The draft NPDES permit authorizes the intake and discharge of non-contact cooling water from the OCS-DC; provides effluent limitations for flow, pH, total residual oxidants (including chlorine), temperature, and through-screen intake velocity; and monitoring and reporting requirements (USEPA 2023). Based on review of the thermal modeling, the USEPA determined that the thermal plume would be relatively small (approximately 15-25 m long and 3-3.5 m wide), would be fully mixed within 25 m on either side of the outfall and a depth of 10 m from the outfall, and that mobile aquatic organisms are expected to be able to avoid any adverse effects from the thermal plume

(USEPA 2023a). USEPA determined that the effluent limitations for temperature and chlorine would be protective of marine life and would not cause unreasonable degradation of the marine environment.

Seafloor/Land disturbance: Seafloor disturbance during offshore O&M activities could occur during routine maintenance of infrastructure on the seabed, such as foundations, scour protection, and cable protection. Certain O&M activities could require presence of either a jack-up vessel or anchored barge vessel. Seafloor disturbance may cause a short-term increase in turbidity, sediment suspension, and deposition. Sunrise Wind would implement BMPs and comply with EPMs to minimize or avoid sediment suspension and deposition during O&M activities. Sediment suspension and deposition would to be localized and only result in short-term increases in turbidity near the location of the disturbance. Potential impacts to water quality would be similar to, but less likely, than during construction because the area of seafloor disturbance would be less.

Port utilization: Several ports are being considered to support O&M activities. Impacts on water quality (i.e., accidental chemical spill or discharge) from port utilization could occur from vessel collision or allision during O&M activities; however, this would be infrequent and less likely than during the construction phase. Impacts on water quality from port utilization during O&M would be negligible or minor.

Presence of structures: The presence of up to 94 WTGs and the OCS-DC would present the risk of an allision and an impact on water quality from an accidental chemical spill, leak, or discharge. The risk of a vessel collision or allision with a structure would be low and unlikely. Scour protection would be used at the WTG foundations which would minimize sediment transport around the foundations and the potential for sediment plumes. The total footprint from foundations with the addition of scour protection is estimated to be 98 ac (0.4 km^2).

The presence of structures could alter the water mixing patterns and the distribution of water quality parameters by changing the thermal stratification and mixing between surface and deep waters (e.g., Carpenter et al. 2016; Cazenave et al. 2016; Schultze et al. 2020). However, there is limited information available for the Mid-Atlantic Bight region. Results from a recent hydrodynamic model of four different WTG build-out scenarios of the offshore MA/RI Lease Area found that offshore wind projects have the potential to alter local and regional physical oceanic processes (e.g., currents, temperature stratification), via their influence on currents from WTG foundations and by extracting energy from the wind (Johnson et al. 2021). Alterations in currents and mixing would affect water quality parameters such as temperature, DO, and salinity, but would vary seasonally and regionally. Overall, impacts on water quality from the presence of structures during O&M would be negligible or minor.

The exposure of offshore wind structures, which are mainly made of steel, to the marine environment can result in corrosion without protective measures. Corrosion is a general problem for offshore infrastructures and corrosion protection systems are necessary to maintain the structural integrity. Protective measures for corrosion (e.g., coatings, cathodic protection systems) are often in direct contact with seawater and have different potentials for emissions (e.g., galvanic anodes emitting metals,

such as aluminum, zinc, and indium, and organic coatings releasing organic compounds due to weathering and leaching). The current understanding of chemical emissions for offshore wind structures is that emissions appear to be low or within natural variability, suggesting a low environmental impact, especially if compared to other offshore activities (Kirchgeorg et al. 2018). Based on the current understanding of offshore wind structure corrosion effects on water quality, BOEM anticipates the potential impact to be minor.

3.5.5.3 Conceptual Decommissioning

3.5.5.3.1 Onshore Activities and Facilities

Impacts on water quality are expected to be similar to or less than those described for the construction phase. The OnCS-DC may be repurposed, and the onshore transmission cable may be abandoned in place which would limit the amount of land disturbance, the potential for an accidental release or discharge, and shorten the length of time needed for decommissioning activities.

3.5.5.3.2 Offshore Activities and Facilities

Impacts on water quality during offshore decommissioning activities are expected to be similar to or less than impacts during the construction phase. There would be a short-term increase in marine vessel use compared to the O&M phase. Decommissioning is expected to be completed within 2 years and any impacts would cease after decommissioning is complete. Decommissioning would occur in accordance with requirements and permits at that time and would have a minor to moderate impact on water quality.

3.5.5.4 Cumulative Impacts of the Proposed Action

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned wind activities. Ongoing and planned wind activities related to onshore development, runoff and discharges, marine transportation-related discharges, dredging and port improvement projects, commercial fishing, military use, submarine cables and pipelines, atmospheric deposition, and climate change would contribute to impacts on water quality through the primary IPFs of accidental releases, anchoring, cable emplacement and maintenance, discharges, land disturbance, seafloor disturbance, port utilization, and presence of structures. The construction, O&M, and decommissioning of offshore wind projects, including onshore and offshore infrastructure, in the GAA would also contribute to the same primary IPFs. However, given the low probability of accidental releases, the temporary impacts of suspended sediment, and the regulatory and permitting requirements to avoid and minimize impacts on water quality (e.g., NPDES permits, Vessel General Permit, OSRP, SPCC Plan, SWPPP), adverse impacts on water quality would be minimized.

Accidental release: The contribution of the Proposed Action to the cumulative accidental release impacts on water quality would likely be short term and minor to moderate due to the low risk and

localized nature of the most likely spills and the use of an OSRP, SPCC Plan, and Materials Management Plan for the Project. Overall, an estimated 1,043,485 gal of coolants, 1,427,665 gal of oils and lubricants, and 452,490 gal of diesel fuel could be used for offshore wind activities in the GAA; approximately 30 percent, 22 percent, and 5 percent would be contributed by the Proposed Action, respectively. In the unlikely event of an accidental release or spill, it would be expected that a small spill would have negligible or minor, short-term impacts, while a larger spill would have potentially minor or moderate impacts for a longer duration.

Anchoring: An estimated area of 1,544 ac of seabed could be disturbed due to anchoring associated with offshore wind activities in the GAA of which approximately 17 percent would be contributed by the Proposed Action. The contribution of the Proposed Action to the cumulative anchoring impacts on water quality would be localized, short term and minor, and would primarily occur during construction and decommissioning.

Cable emplacement and maintenance: The contribution from the Proposed Action to increased sediment concentration and turbidity would be additive with the impact(s) of any and all other cable-installation activities, including offshore wind activities, that occur within the water quality GAA and that would have overlapping timeframes during which sediment is suspended. BOEM anticipates that the contribution of the Proposed Action to the cumulative impacts would likely be short term, localized, and minor to moderate.

Discharges: Cumulative impacts on water quality from the Proposed Action due to discharges would be additive with the impacts from discharges associated with other offshore wind activities in the GAA during the same time frame. Vessel traffic would increase under the Proposed Action and vessel routes may overlap. However, any discharge events would likely be staggered over time and localized. Further, all vessels would be required to comply with all state and federal regulatory requirements and permits related to the prevention and control of discharges and accidental spills. BOEM anticipates that the contribution of the Proposed Action to the cumulative impacts would likely be short term, localized, and minor to moderate and would primarily occur during the construction and decommissioning phases.

Seafloor/Land disturbance: The contribution of the Proposed Action to the cumulative onshore land disturbance impacts on water quality would likely be localized, short term, and negligible due to the low likelihood that onshore activities would overlap geographically or temporally. Compliance with the EM&CP, including the SWPPP and erosion control measures, would minimize or eliminate erosion into nearby coastal, surface, or ground waters.

The estimated area of seafloor disturbance from offshore wind activities in the water quality GAA from offshore export cable construction is 3,174 ac of which approximately 37 percent is contributed by the Proposed Action. Approximately 5,187 ac of seabed are estimated to be disturbed from construction of IAC in the GAA; the Proposed Action would contribute approximately 41 percent of the total. BOEM anticipates the contribution of the Proposed Action to the cumulative seafloor disturbance impacts would likely be short term, localized, but noticeable, and have a minor to moderate impact.

Port utilization: Cumulative port utilization impacts of the Proposed Action would likely be short term and minor. There could be limited overlap in construction schedules for the Proposed Action and the Revolution Wind Project in the water quality GAA which could result in moderate impacts in the unlikely event that a collision or allision were to occur.

Presence of structures: Cumulative impacts on water quality from the Proposed Action due to the presence of structures would be additive with the impacts from other offshore wind projects in the water quality GAA. By 2030, approximately 442 structures (WTGs and converter stations) associated with offshore wind activities could be present within the GAA. BOEM anticipates that the cumulative impacts would be negligible to minor.

The exposure of offshore wind structures to the marine environment can result in emissions of metals and organic compounds from corrosion protection systems. However, the current understanding of chemical emissions for offshore wind structures is that emissions appear to be low, suggesting a low environmental impact (Kirchgeorg et al. 2018). Research suggests that this impact may be site-specific and remains an area of ongoing investigation (e.g., BSH and Hereon 2022).

3.5.5.5 Conclusions

Impacts of the Proposed Action

All onshore and offshore activities during the construction, O&M, and decommissioning phases would be conducted in compliance with federal and state regulations and permits, with BMPs, and EPMs described in Section 4.3.3.3 of the COP (Sunrise Wind 2023) which would minimize or avoid impacts on water quality. Although the risk of an accidental discharge or release of chemicals, oils, fuel, lubricants, trash, or debris is low during all phases of the Proposed Action, in the event a release was to occur, the impact on water quality would be minor or moderate depending on the volume of the spill and the type of material spilled. The impact would be short-term because Sunrise Wind would follow regulations and permitting rules requiring rapid containment and clean up. Impacts from port utilization or the presence of structures would be negligible or minor. Sediment suspension, deposition, and increased turbidity would have a minor impact during anchoring, cable emplacement and maintenance, and seafloor/land disturbance; sediment plumes would be localized and short term. Impacts on water quality from the Proposed Action from individual IPFs would range from negligible to moderate. Overall, the Proposed Action would result in **minor** adverse impacts.

Cumulative Impacts of the Proposed Action

Ongoing and planned activities related to onshore or offshore development, recreation and commercial activities, military use, port improvement, dredging, and submarine cable and pipeline emplacement would contribute to impacts on water quality through the primary IPFs of accidental releases, cable emplacement and maintenance, discharges, land/seafloor disturbance, port utilization, and the presence of structures by causing sediment suspension and deposition, increased turbidity, altering

water currents and water chemistry, or causing exceedances of water quality standards. These impacts would be each be short-term and localized and have a negligible to moderate impact. The impacts from a large-volume accidental release could be moderate. Overall, BOEM anticipates that the potential cumulative impacts on water quality would be **minor** adverse.

3.5.6 Alternative C-1 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG positions

Alternative C-1 would have the same number of turbine locations (94 WTGs) as the Proposed Action that may be approved by BOEM; however, 8 WTG positions from Priority Area 1 would be excluded from consideration for development. There would be no changes to the onshore facilities, the SRWEC alignments, or the construction timeline and activities. The changes proposed in Alternative C-1 would focus on the arrangement and generating capacity of the WTGs and necessary rearrangement of the IAC to accommodate the new spatial arrangements. Therefore, the discussion of impacts in these sections would focus on the attributes that are substantively different from those under the Proposed Action. In addition, the changes in spatial arrangement are unlikely to affect the duration, intensity, or magnitude of the effects described for the following IPFs: port utilization. NEPA directs that an EIS focus on the differences among the alternatives to allow evaluation of their comparative merits. This focus does not disregard the impacts previously described, but the reader is directed to review the direct and indirect impacts to water quality resources described under the Proposed Action in Section 3.5.5. A comparison of the alternatives and their potential impacts by IPF is provided in Section 3.5.9.

3.5.6.1 Construction and Installation

3.5.6.1.1 Onshore Activities and Facilities

Under Alternative C-1, impacts on water quality from onshore construction and installation activities would be the same as described for the Proposed Action.

3.5.6.1.2 Offshore Activities and Facilities

Under Alternative C-1, the construction of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. There would be no substantive difference in the potential for impacts to water quality from anchoring, cable emplacement, discharges, accidental release, seafloor disturbance, port utilization, and presence of structures under Alternative C-1 as compared to the Proposed Action because the same number of WTGs would be installed.

3.5.6.2 Operations and Maintenance

3.5.6.2.1 Onshore Activities and Facilities

Under Alternative C-1, impacts on water quality from onshore O&M activities would be the same as described for the Proposed Action.

3.5.6.2.2 Offshore Activities and Facilities

Under Alternative C-1, impacts to water quality during offshore O&M activities would likely be similar to the Proposed Action because the same number of WTGs would be operated and maintained. There would be no substantive difference in the potential for impacts to water quality from anchoring, cable emplacement, discharges, accidental release, seafloor disturbance, port utilization, and presence of structures under Alternative C-1 as compared to the Proposed Action because the same number of WTGs would be operated and maintained.

3.5.6.3 Conceptual Decommissioning

3.5.6.3.1 Onshore Activities and Facilities

Under Alternative C-1, impacts on water quality from onshore decommissioning activities would be the same as described for the Proposed Action.

3.5.6.3.2 Offshore Activities and Facilities

Under Alternative C-1, water quality impacts during decommissioning of the offshore facilities would be the same as described for the Proposed Action because there is no difference in offshore components between the Proposed Action and Alternative C-1.

3.5.6.4 Cumulative Impacts of Alternative C-1

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to water quality impacts from ongoing and planned activities would not be substantially different than the Proposed Action. Considering all the IPFs together, BOEM anticipates that the cumulative impacts of Alternative C-1 would have negligible to moderate impacts on water quality.

3.5.6.5 Conclusions

Impacts of Alternative C-1

Under Alternative C-1, impacts on water quality from onshore and offshore construction, O&M, and decommissioning would be similar to the Proposed Action. The potential for offshore impacts from seafloor disturbance, anchoring, cable emplacement, accidental releases or discharges, port utilization, and the presence of structures would not change substantially under Alternative C-1 compared to the

impacts described above for the Proposed Action because the same number of WTGs would be installed, maintained, and decommissioned. Overall, Alternative C-1 would have a **minor** adverse impact on water quality.

Cumulative Impacts of Alternative C-1

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to water quality impacts from ongoing and planned activities would not be substantially different than the Proposed Action. Considering all the IPFs together, BOEM anticipates that the cumulative impacts of Alternative C-1 would have **minor** adverse impacts on water quality.

3.5.7 Alternative C-2 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

For Alternative C-2, the analysis was expanded upon to relocate up to 12 additional WTG positions from the Priority Areas to the eastern side of the Lease Area, in addition to removing up to 8 WTG positions identified in Alternative C-1. This alternative assumes that habitat is more suitable for development on the eastern side of the Lease Area, but surveys conducted in this area in the summer of 2022 found that the southeastern side of the Lease Area contains glauconite substrate that is unsuitable for WTG installation.

3.5.7.1 Construction and Installation

3.5.7.1.1 Onshore Activities and Facilities

Under Alternative C-2, impacts on water quality from onshore construction and installation activities would be the same as described for the Proposed Action.

3.5.7.1.2 Offshore Activities and Facilities

Under Alternative C-2, the construction of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Alternative C-2 includes the relocation of up to 12 WTGs to the eastern side of the Lease Area. Impacts on water quality from the individual IPFs of accidental releases and discharges, cable emplacement and maintenance, and seafloor disturbance would be marginally higher than the Proposed Action because of the longer vessel travel distance and the longer length of IAC needed to reach the eastern side of the Lease Area. Impacts from anchoring, port utilization, and the presence of structures would not be substantively different than the Proposed Action.

3.5.7.2 Operations and Maintenance

3.5.7.2.1 Onshore Activities and Facilities

Under Alternative C-2, impacts on water quality from onshore O&M activities would be the same as described for the Proposed Action.

3.5.7.2.2 Offshore Activities and Facilities

Under Alternative C-2, the O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Under Alternative C-2, impacts to water quality during offshore O&M activities from cable maintenance would be slightly higher than the Proposed Action because of the greater amount of IAC needed to reach the eastern side of the Lease Area. There would be slightly greater risk of an accidental release or discharge because of the longer marine vessel travel distance. Under this alternative, the maintenance schedule would likely be the same as the Proposed Action. Impacts from anchoring, port utilization, or the presence of structures would be the same as the Proposed Action.

3.5.7.3 Conceptual Decommissioning

3.5.7.3.1 Onshore Activities and Facilities

Under Alternative C-2, impacts to water quality from onshore decommissioning activities would be the same as described for the Proposed Action.

3.5.7.3.2 Offshore Activities and Facilities

Water quality impacts during decommissioning of the offshore facilities would be substantially the same as described for the Proposed Action. Potential water quality impacts from accidental releases or discharges and seafloor disturbance would be slightly higher because of the longer IAC and transit route to the relocated WTGs.

3.5.7.4 Cumulative Impacts of Alternative C-2

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to water quality impacts from ongoing and planned activities would be slightly more, but not materially different, than the Proposed Action and Alternative C-1. Considering all the IPFs together, BOEM anticipates that the cumulative impacts of Alternative C-2 would have **minor** impacts on water quality.

3.5.7.5 Conclusions

Impacts of Alternative C-2

Impacts on water quality under Alternative C-2 from construction, O&M, and decommissioning of the WTGs would be similar to the Proposed Action and Alternative C-1 because the same number of WTGs

would be installed. Relocating up to 12 WTGs to the eastern side of the Lease Area would require longer transit distances and a change in the layout of the IAC. The contribution of Alternative C-2 to water quality impacts during construction, O&M, and decommissioning would be slightly more, but not materially different, than the Proposed Action and Alternative C-1 because of the longer length of IAC needed to reach the eastern side of the Lease Area. Overall, Alternative C-2 would have a **minor** adverse impact on water quality.

Cumulative Impacts of Alternative C-2

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to water quality impacts from ongoing and planned activities would be slightly more, but not materially different, than the Proposed Action and Alternative C-1. Considering all the IPFs together, BOEM anticipates that the cumulative impacts of Alternative C-2 would have **minor** adverse impacts on water quality.

3.5.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Alternatives C-3a, C-3b, and C-3c consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Under Alternative C-3a, up to 87 11-MW WTGs would be installed in the 87 potential positions. Under Alternative C-3b, up to 84 WTGs would be installed in the 87 potential positions. Under Alternative C-3c, 80 WTGs would be installed in the 87 potential positions.

3.5.8.1 Construction and Installation

3.5.8.1.1 Onshore Activities and Facilities

Under Alternative C-3, impacts on water quality from onshore construction and installation activities would be the same as described for the Proposed Action.

3.5.8.1.2 Offshore Activities and Facilities

Under Alternative C-3, the construction of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Impacts on water quality from the individual IPFs of accidental releases, discharges, anchoring, cable emplacement, seafloor disturbance, and presence of structures would be marginally less than the Proposed Action because of the reduced number of WTGs and length of IAC that would be installed. Impacts from port utilization would be similar to the Proposed Action.

3.5.8.2 Operations and Maintenance

3.5.8.2.1 Onshore Activities and Facilities

Under Alternative C-3, impacts on water quality from onshore O&M activities would be the same as described for the Proposed Action.

3.5.8.2.2 Offshore Activities and Facilities

Under Alternative C-3, the O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Under Alternative C-3, a reduced number of WTGs and length of IAC would require O&M resulting in reduced impacts to water quality from the IPFs of anchoring, cable maintenance, accidental release, discharges, seafloor disturbance, and presence of structures. Impacts from port utilization would not be substantively different than the Proposed Action.

3.5.8.3 Conceptual Decommissioning

3.5.8.3.1 Onshore Activities and Facilities

Under Alternative C-3, impacts to water quality from onshore decommissioning activities would be the same as described for the Proposed Action.

3.5.8.3.2 Offshore Activities and Facilities

Under Alternative C-3, water quality impacts during decommissioning of the offshore facilities would be marginally lower than the Proposed Action because of the smaller number of WTGs and amount of cable that would need to be decommissioned.

3.5.8.4 Cumulative Impacts of Alternative C-3

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-3 to water quality impacts from ongoing and planned activities would be slightly less, than the Proposed Action, Alternative C-1, and Alternative C-2. Considering all the IPFs together, BOEM anticipates that the cumulative impacts of Alternative C-3 would have **minor** impacts on water quality.

3.5.8.5 Conclusions

Impacts of Alternative C-3

Under Alternative C-3, impacts on water quality from onshore construction, O&M, and decommissioning would be the same as those described for the Proposed Action, Alternative C-1, and Alternative C-2. Impacts on water quality from offshore activities would be slightly less under Alternative C-3 compared to the impacts described above for the Proposed Action, Alternative C-1, and Alternative C-2 because of

the smaller number of WTGs and shorter length of cable. Overall, Alternative C-3 would have a **minor adverse** impact on water quality.

Cumulative Impacts of Alternative C-3

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-3 to water quality impacts from ongoing and planned activities would be slightly less, than the Proposed Action, Alternative C-1, and Alternative C-2. Considering all the IPFs together, BOEM anticipates that the cumulative impacts of Alternative C-3 would have **minor** adverse impacts on water quality.

3.5.9 Comparison of Alternatives

The expected impacts discussed above for the Proposed Action would not change substantially under the alternatives because the same construction, O&M, and decommissioning activities would occur. Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall negligible to moderate adverse impacts on water quality resources, however, the magnitudes would be slightly different. Alternative C-2 would have slightly higher adverse impacts than the Proposed Action, Alternative C-1, and Alternative C-3 because of the longer length of IAC needed to reach the eastern side of the Lease Area. Alternative C-3 would have slightly less impact because of the smaller number of WTGs and reduced length of IAC. Table 3.5-5 provides an overall summary of alternative impacts.

Table 3.5-5. Comparison of Alternative Impacts on Water Quality

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility due to Glauconite Sands (Alternative C-3)
No Action Alternative: Existing environmental trends and ongoing activities would continue. Overall, **minor** adverse impacts are anticipated. Negligible to minor impacts from discharges, presence of structures, and seafloor or land disturbance. Minor to moderate effects from anchoring, cable emplacement and maintenance, and port utilization. Moderate effects from accidental releases. *Cumulative Impacts of the No Action Alternative:*	*Proposed Action:* **Minor** adverse effects on water quality overall. Minor effects from anchoring, cable emplacement and maintenance, and seafloor or land disturbance. Minor or moderate effects from accidental releases or discharges, including non-contact cooling water. Negligible or minor effect from port utilization or the presence or structures. *Cumulative Impacts of the Proposed Action:* Minor or moderate effects from anchoring,	*Alternative C-1:* **Minor** adverse effects on water quality overall. Minor effects from anchoring, cable emplacement and maintenance, and seafloor or land disturbance. Minor or moderate effects from accidental releases or discharges, including non-contact cooling water. Negligible or minor effect from port utilization or the presence or structures. *Cumulative Impacts of Alternative C-1*: Minor or moderate effects from anchoring, discharges, cable	*Alternative C-2:* **Minor** adverse effects on water quality overall. Minor effects from anchoring, cable emplacement and maintenance, and seafloor or land disturbance. Minor or moderate effects from accidental releases or discharges, including non-contact cooling waters. Negligible or minor effect from port utilization or the presence or structures. *Cumulative Impacts of Alternative C-2*: Minor or moderate effects from anchoring, discharges, cable	*Alternative C-3:* **Minor** adverse effects on water quality overall. Minor effects from anchoring, cable emplacement and maintenance, and seafloor or land disturbance. Minor or moderate effects from accidental releases or discharges, including non-contact cooling waters. Negligible or minor effect from port utilization or the presence or structures. *Cumulative Impacts of Alternative C-3*: Minor or moderate effects from anchoring, discharges, cable

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility due to Glauconite Sands (Alternative C-3)
Negligible to minor impacts from discharges, presence of structures, and seafloor or land disturbance. Minor to moderate effects from anchoring, cable emplacement and maintenance, and port utilization. Moderate effects from accidental releases. Overall, **minor** adverse cumulative impacts are anticipated.	discharges, cable emplacement and maintenance, seafloor or land disturbance. Moderate effects from accidental releases. Negligible or minor effect from port utilization or the presence or structures. Overall, **minor** adverse cumulative impacts are anticipated.	emplacement and maintenance, seafloor or land disturbance. Moderate effects from accidental releases. Negligible or minor effect from port utilization or the presence or structures. Overall, **minor** adverse cumulative impacts are anticipated.	emplacement and maintenance, seafloor or land disturbance. Moderate effects from accidental releases. Negligible or minor effect from port utilization or the presence or structures. Overall, **minor** adverse cumulative impacts are anticipated.	emplacement and maintenance, seafloor or land disturbance. Moderate effects from accidental releases. Negligible or minor effect from port utilization or the presence or structures. Overall, **minor** adverse cumulative impacts are anticipated.

3.5.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative which would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Under Alternative C-3b, impacts on water quality from onshore construction, O&M, and decommissioning would be the same as those described for the Proposed Action. Impacts on water quality from offshore activities would be slightly less under Alternative C-3b compared to the impacts described above for the Proposed Action, Alternative C-1, and Alternative C-2 because of fewer WTGs and shorter length of cable. Overall, Alternative C-3b would have a **minor** impact on water quality.

3.5.11 Proposed Mitigation Measures

No additional measures to mitigate impacts on water quality have been proposed for analysis.

3.5.11.1 Effect of Measures Incorporated into the Preferred Alternative

Since no mitigation measures have been proposed, impacts levels for the Preferred Alternative would remain as described above in Section 3.5.8.

3.6 Bats

This section examines potential impacts on bats from the proposed Project, alternatives, and future offshore wind activities in the GAA (Appendix D, Figure D-3). The bat GAA, as depicted in Appendix D (*Geographical Analysis Areas*) includes the United States eastern coast from Maine to Florida extending from 0.5 mi (0.8 km) onshore to cover Project component sites and 100 mi (161 km) offshore.

3.6.1 Description of the Affected Environment and Future Baseline Conditions

Eight of the nine bat species present in the northeastern United States and the GAA (Appendix D) are found on Long Island and have the potential to occur within or proximate to the offshore Sunrise Wind Export Cable-New York State/offshore converter station (SRWEC-NYS/SRWEC-OCS-DC) and the onshore activities: OnCS-DC, transmission cable, and interconnection cable (Stegemann and Hicks n.d.). These species can be categorized into two groups based on roosting habitat and migratory behavior: cave-hibernating bats and migratory tree bats. The five non-migratory cave-hibernating bats include the eastern small-footed bat (*Myotis leibii*), the big brown bat (*Eptescius fuscus*), the ESA-listed northern long-eared bat (*Myotis septentrionalis*; endangered) and tricolored bat (*Perimyotis subflavus*; endangered), and the little brown bat (*Myotis lucifugus*) which is currently under review for listing under the ESA. The three migratory tree-roosting bats include the eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*) (Stantec 2018b). The ESA-listed Indiana bat (*Myotis sodalist*; endangered) is not known to occur in Long Island's Nassau or Suffolk counties (USFWS 2021) and to date has not been located during regional offshore vessel-based acoustic bat surveys (Pelletier et al. 2013; Stantec 2018b; Sunrise Wind 2023). Therefore, this species is not expected to occur in the proposed Project Area.

In North America, insectivorous bats have a general hearing range of 10 to 100 kilohertz (kHz), depending on the species and specific behavior, with the most sensitive frequency band between 20 and 50 kHz and are generally unable to hear frequencies below 500 hertz (Hz) (DoN 2018). While hearing is echolocating bats' primary sense for foraging and avoiding obstacles, they also use a combination of auditory and visual cues, magneto-reception, and spatial memory for long-distance navigation. Hoary bats, for example, sometimes abandon echolocation when flying, relying solely on intermittent visual cues (True 2021). When there are no reflective surfaces for echolocation, it is possible that bats flying over the ocean use visual cues and therefore are unlikely to fly over the ocean when visibility is low (True 2021).

Bats are active in the region from March through November and use a wide variety of terrestrial habitats (e.g., forests, open fields. riparian corridors, wetlands, urban areas) for foraging. Caves, mine shafts, understructure of bridges, and trees are used for roosting (COP Section 4.4.7, Sunrise Wind 2023). In late summer and fall, non-migratory cave-dwelling bats disperse from summer habitats to winter hibernacula (caves, abandoned mines). Migratory tree-roosting bats migrate longer distances

over land and offshore to overwinter in the milder climate of southern states, often at coastal locations (Stantec 2016; Stantec 2018b; Sunrise Wind 2023).

Sightings and acoustic recordings have detected bats flying over the open ocean in the Atlantic region between North Carolina and Nova Scotia (Solick and Newman 2021). In contrast to cave-dwelling bats, which are rarely found offshore, migratory tree-roosting bats have been sporadically found offshore during spring and fall migrations, especially in low wind and mild weather conditions. Acoustic studies observed that 80 percent of offshore bat detections in this region occurred during August and September (Dowling et al. 2017; Hatch et al. 2013; Pelletier et al. 2013; Sunrise Wind 2023). Offshore sightings were recorded in July, August, September, and October (Solick and Newman 2021; Hatch et al. 2013). Recent studies detected bats up to 80 mi (129 km) from land (Stantec 2016), and historical data include observations of bats as far offshore as 1,212 mi (1,950 km) (Hatch et al. 2013). Bats can fly at high altitudes of at least 8,000 ft (2,438 m) (Peurach 2003). Flight altitudes of over 656 ft (200 m) above sea level have been documented in the offshore Mid-Atlantic (Hatch et al. 2013).

In summary, non-migratory cave-hibernating bat activity is greater onshore and at coastal locations when compared to offshore (NPS 2018; Smith and McWilliams 2016; Stantec 2018b; Sunrise Wind 2023). Migratory tree-roosting bats are expected to be more common in onshore and nearshore locations but may occur offshore (Pelletier et al. 2013; Sunrise Wind 2023; Stantec 2016). A description of existing east coast bat resources is presented in the Vineyard Wind 1 FEIS Volume II: Appendix A (BOEM 2021). Additional distribution information is included in the COP Volume I, Section 4.4.7 (Sunrise Wind 2023) and Appendix P1 (Stantec 2022).

Future ongoing onshore and offshore activities (disturbance, displacement, injury, mortality, and habitat conversion) would continue to occur in the region. These impact-producing activities would have minor short- and long-term effects on regional bat populations.

3.6.1.1 ESA-Listed (and Proposed Species)

Northern Long-eared Bat (Endangered)

There are no records of northern long-eared bats over the OCS (ESS Group Inc. 2014; Pelletier et al. 2013; Peterson and Pelletier 2016). A recent study of bat movement on Martha's Vineyard did not find evidence of offshore movement by northern long-eared bats and presented evidence of northern long-eared bats hibernating on Martha's Vineyard and Nantucket islands (Dowling et al. 2017). Similarly, WTG acoustic detectors in the Dominion Energy CVOW pilot project off Virginia did not detect northern long-eared bat (Dominion 2022). During offshore construction of the Block Island Wind Farm, bats were monitored with acoustic detectors on boats; among the 1,546 passes of bats, no northern long-eared bats were detected (Stantec 2018b). During post-construction monitoring of Block Island Wind Farm (August 2017 to January 2018), no northern long-eared bats were detected out of the 1,086 passes recorded by bat acoustic detectors mounted on two turbines 3 mi (5 km) from shore, and 99 percent of bat passes occurred when wind speeds were less than 6.4 feet per second (fps; 5 meters per second

[mps]) (33 percent when there was no wind) (Stantec 2018b). Therefore, given the rarity of the bat in the region, its ecology, and habitat requirements, it is extremely unlikely northern long-eared bats would traverse the offshore portions of the Project Area or experience any effects from offshore activities.

Little Brown Bat (Candidate)

Little brown bats have been recorded in the onshore portions of the Project Area and have the potential to occur in the offshore portions of the Project Area. In addition to historical observations of offshore flights, little brown bats tagged on Martha's Vineyard were detected offshore (Dowling et al. 2017; NYSERDA 2017). They are capable of extended flights, making seasonal migrations between 32 and 344 mi (51 and 554 km) between their spring roosts and hibernacula (Dowling et al. 2017). Because there is documented presence of little brown bats at many of the islands in the Cape Cod region, BOEM anticipates that it is possible that they may migrate through the offshore Project Area where WTGs would operate.

Information regarding little brown bats migration patterns and flight elevations is very limited. A European study on collision risk for bats at wind farms found significant correlation between flight height and collision risk (Roemer et al. 2017). Small species of the genus *Myotis* were found to fly at the lowest heights, with very little activity at a height of 98 ft (30 m), and also had the lowest susceptibility to collision with wind turbines despite having the second highest activity levels. Lacking direct data for little brown bats, we anticipate similar collision risk for little brown bats because they are a small species of the genus *Myotis* and anticipate a very low risk of collision due to the SRWF turbine blades operating above 131 ft (40 m).

Standard environmental operating conditions for the proposed WTGs include cut-in wind speeds of 7 to 11 miles per hour (mph; 3 to 5 mps). The WTGs would automatically shut down outside of the operational criterial for the WTG design. In general, bat activity declines as wind speed increases, which narrows the band of wind speeds where bats are active and WTGs are operating, further reducing the likelihood of little brown bats flying through the RSZ of operating WTGs.

Tricolored Bat (Proposed)

There is evidence of a limited presence of tricolored bats in the onshore portions of the Project Area which includes suitable habitat for their spring and summer roosting (Jackson and Schwager 2012). Prior to the appearance of WNS, tricolored bats were still considered rare in NYS, and their numbers have steadily declined (NYSDEC 2017). They have previously been detected in offshore environments; however, there is little data on their offshore presence compared to other species (Peterson and Pelletier 2016). Tricolored bats are short-distance migrants, generally migrating less than 31 mi (50 km) between their hibernacula and summer habitats (Griffin 1940). This short range of migration would preclude their migration through the Project Area where WTGs would be located. When foraging they typically travel as far as 3 to 4 mi (5 to 6 km) from their roosting areas (Poissant 2009), while the nearest WTG is approximately 15 mi (24 km) offshore. Because WTGs are located in areas where tricolored bats

are not expected to be able to reach, either during migration or foraging, the likelihood of collision with operating WTGs is extremely unlikely to occur.

3.6.2 Impact Level Definitions for Bats

This Final EIS uses a four-level classification scheme to analyze potential impact levels on bats from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.6-1 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for bats. Table G-5 in Appendix G (*Impact-Producing Factor Tables*) identifies potential IPFs, issues, and indicators to assess impacts to bats.

Table 3.6-1. Definition of Potential Adverse and Beneficial Impact Levels for Bats

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	Impacts on individual bats and/or their habitat, if any, would be at the lowest levels of detection and barely measurable, with no perceptible consequences to individuals or the population.	Impacts on individual bats and/or their habitat would be beneficial but at the lowest levels of detection and barely measurable.
Minor	Impacts on bats are detectable and measurable but are low intensity, highly localized, and short-term in duration. Impacts on individuals and/or their habitat do not lead to population-level effects.	Impacts on individual bats and/or their habitat are detectable and measurable. The effects are likely to benefit individuals, be localized, and/or be short-term and are unlikely to lead to population-level effects.
Moderate	Impacts on individual bats and/or their habitat are detectable and measurable; they are of medium-intensity, can be short- or long-term, and can be localized or extensive. Impacts on individuals and/or their habitat could have population-level effects, but the population can sufficiently recover from the impacts or enough habitat remains functional to maintain the viability of the species both locally and throughout their range.	Impacts on individual bats and/or their habitat are detectable and measurable. These benefits may affect large areas of habitat, be long-term, and/or affect a large number of individuals and may lead to a detectable increase in populations but is not expected to improve the overall viability or recovery of affected species or population.
Major	Impacts on individual bats and/or their habitat are detectable and measurable; they are of severe intensity, can be long-lasting or permanent, and are extensive. Impacts to individuals and/or their habitat would have severe population-level effects and compromise the viability of the species.	Impacts on individual bats and/or their habitat are detectable and measurable. These impacts on habitat may be short-term, long-term, or permanent and would promote the viability of the affected species/population and/or increase the affected species/population levels.

3.6.3 Impacts of Alternative A - No Action on Bats

When analyzing the impacts of the No Action Alternative on bats, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities on the baseline conditions for bats. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.6.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for bats would continue to follow current regional trends and respond to IPFs introduced by other ongoing activities. Ongoing activities within the GAA that contribute to impacts on bats are generally associated with onshore impacts, including onshore construction and climate change. Onshore construction activities and associated impacts are expected to continue at current trends and have the potential to affect bat species. Impacts associated with climate change have the potential to reduce reproductive output and increase individual mortality and disease occurrence. Other future non-Project actions other than offshore wind development activities that may affect bats include new submarine cables and pipelines, oil and gas activities, increasing onshore construction, marine minerals extraction, port expansions, and installation of new structures on the OCS (refer to Appendix E for a complete description of ongoing and planned activities). These activities may result in short-term or permanent displacement and injury or mortality to individual bats, but population-level effects would not be expected.

Global climate change is an ongoing risk to bats although the associated impact mechanisms are complex, not fully understood, and difficult to predict with certainty. Possible impacts to bats include increased storm severity and frequency; increased disease frequency; and altered habitat, ecology, and migration patterns (Sherwin et al. 2013). Over time, climate change and coastal development would alter existing habitats, rendering some areas unsuitable for certain species and more suitable for others.

Ongoing offshore wind activities within the GAA that contribute to impacts on bats include:

- Continued O&M of the Block Island project (5 WTGs) installed in state waters;
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Fork projects would affect bats through the primary IPFs of noise, presence of structures, and land disturbance. Ongoing offshore wind activities would have the same type of impacts from noise, presence of structures, and land disturbance that are described in detail in the following section for planned offshore wind activities, but the impacts would be of lower intensity.

The sections below summarize the potential impacts of planned offshore wind activities on bats during construction, O&M, and decommissioning of the projects. The federally listed northern long-eared bat is the only bat species listed under the ESA that may be affected by other offshore wind activities. Impacts on the northern long-eared bat would most likely be limited to onshore impacts, and generally during onshore facility construction.

3.6.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Other planned non-offshore wind activities that may affect bats include new submarine cables and pipelines, oil and gas activities, increasing onshore construction, marine minerals extraction, port expansions, and installation of new structures on the OCS (see Appendix E for a complete description of planned activities). These activities may result in short-term and permanent onshore habitat impacts and short-term or permanent displacement and injury of or mortality to individual bats, but population-level effects would not be expected.

The paragraphs below summarize the potential impacts of planned offshore wind activities on bats during construction, O&M, and decommissioning of the projects. The federally listed northern long-eared bat is the only bat species listed under the ESA that may be affected by other offshore wind activities. Impacts on the northern long-eared bat would most likely be limited to onshore impacts, and generally during onshore facility construction. Construction of numerous offshore wind projects (approximately 29 in varying stages of development) is projected for the period of 2022 to 2030. Future offshore wind activities may affect bats through the following primary IPFs.

Land disturbance: A small amount of infrequent construction impacts associated with onshore power infrastructure would be required over the next 6 to 10 years to connect offshore future wind energy projects to the electric grid. Typically, this would require only small amounts of natural habitat removal as the onshore facilities would be constructed in developed areas. Short-term impacts associated with habitat loss and/or avoidance or displacement during construction may occur, but no injury or mortality of individuals would be expected. As such, onshore land disturbance construction associated with future offshore wind development would short-term, minor, and not be expected to appreciably contribute to overall impacts on bats (BOEM 2019).

Noise: Onshore construction noise may result in short-term displacement of individual bats (Schaub et al. 2008). Offshore construction, particularly pile-driving activities, would create noise and may temporarily displace bats; however, research studies indicate that bats may be less sensitive to short-term changes in noise thresholds than other terrestrial animals and that no short-term changes or permanent loss in hearing would be expected from noise (Simmons et al. 2016). Offshore construction noise could result in avoidance or displacement, but these impacts are expected to be short-term due to

the known limited use of offshore areas by bats during spring and fall migration periods (refer to Section 3.6.1). Therefore, the overall impact of construction noise to bats would be minor.

Traffic: Most of the construction vehicle activities for future wind energy projects would occur during daytime hours which are non-active periods for bats. It is possible for vehicle approaches to disturb bats, particularly near dusk or pre-sunrise times. Maintenance vessels would be present and operating during offshore O&M activities. Direct collision mortality impacts from construction traffic and stationary vehicles would be expected to be rare events since bats use echolocation to avoid objects. Indirect disturbance impacts may occur but would be short-term. Support vessels present during WTG construction and export cable activities may provide artificial roosting sites for bats and provide a beneficial effect in energy conservation. Onshore cable construction would occur primarily during the day in mostly developed onshore locations where bats are not roosting. The onshore impacts to bats from construction and installation traffic range from negligible to minor and short- to long-term. The impacts to bats from anticipated O&M vessel cable-laying traffic would be short-term, beneficial, and minor.

Lighting: Nighttime lighting associated with onshore structures and construction vessels could attract and concentrate insects and, therefore, attract foraging bats. In addition, this type of lighting can influence the composition and abundance of insects (Davies et al. 2012). If insects are attracted to construction lighting, then foraging bats in the area may benefit from lighting; however, light associated collision impacts are not expected because bats use echolocation to avoid structures. Acoustic bat detection data confirmed bat utilization of onshore and nearshore environments to be much greater than offshore environments. Non-migratory cave-hibernating bat activity is greater onshore and at coastal locations compared to offshore (NPS 2018; Smith and McWilliams 2016; Stantec 2016; Sunrise Wind 2023). Migratory tree-roosting bat activity is more common onshore and nearshore than offshore (Pelletier et al. 2013; Sunrise Wind 2023). Onshore light attraction impacts for bats range from beneficial and negligible to minor and long-term during construction and O&M.

Presence of structures: The primary offshore threats to bats from future offshore wind energy projects are from the potential disruption of migration patterns and mortality via collisions with WTGs. Offshore structures may attract bats or serve as concentration points for offshore activity (Peterson and Pelletier 2016), putting them at risk of collision with operating WTG blades. Although adverse impacts to bats resulting from collision mortality cannot be quantified based on existing studies, some level of mortality is expected during operations at offshore wind facilities (Solick and Newman 2021). Any new operating facility would require a thorough regulatory and environmental review to avoid, minimize, and mitigate adverse impacts to bats. Outside of migration, bats are infrequently found offshore. In addition, the proposed 1.0-nm (1.9-km) spacing between WTG structures with future offshore wind development and the distribution spacing between known projects would reduce collision exposure risk. Individual migratory bats would pass through the rotor-swept zone (RSZ) or pass by wind development sites with only slight course corrections. As a result, adverse impacts to bats would be minor and long-term.

3.6.3.3 Impacts of Alternative A on ESA-Listed Species

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action). Based on the information contained in this document, BOEM anticipates that the reasonably foreseeable offshore wind activities are likely to result in minor adverse impacts to the northern long-eared, little brown, and tricolored bats.

3.6.3.4 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and conceptual decommissioning would not occur; and potential impacts on bats associated with the proposed Project would not occur; however, ongoing activities would have continued short- to long-term impacts on bats, primarily through construction-related displacement and operational noise, lighting, collision risk, habitat changes, and climate change. Onshore habitat removal areas are small when compared with other past, present, and reasonably foreseeable activities in the region. Population-level effects are not expected to occur to bats from future activities. BOEM anticipates that the overall impacts associated Alternative A, the No Action Alternative, when combined with all other ongoing activities (including ongoing offshore wind projects) in the GAA would result in overall **minor** adverse impacts.

Based on available literature, non-migratory cave-hibernating bats do not typically occur in the OCS, while migratory tree-roosting bats are expected to be infrequent and limited users of the OCS. The IPFs associated with future OCS wind development projects are not expected to significantly affect bat populations. BOEM anticipates that the bat impacts due to ongoing activities associated with the Alternative A - No Action of these ongoing activities would be **minor** adverse. BOEM anticipates that the overall impacts associated Alternative A, the No Action Alternative, when combined with all other planned activities (including offshore wind) in the GAA would result in overall **minor** adverse impacts.

Cumulative Impacts of the No Action Alternative

Other planned non-offshore wind activities that may affect bats include new submarine cables and pipelines, oil and gas activities, increasing onshore construction, marine minerals extraction, port expansions, and installation of new structures on the OCS (see Appendix E for a complete description of planned activities). These activities may result in short-term and permanent onshore habitat impacts and short-term or permanent displacement and injury of or mortality to individual bats, but population-level effects would not be expected. BOEM anticipates that the overall cumulative impacts associated Alternative A, the No Action Alternative, when combined with all ongoing and planned activities (including offshore wind) in the GAA would result in overall **minor** adverse impacts to bats.

3.6.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than those described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts to bats:

- The extent of forested bat foraging/roosting habitat removal at the proposed onshore facility site and/or along the onshore cable route;
- Timing of onshore construction; and
- WTG number and size.

Variability of the proposed Project design is outlined in Appendix C. Below is a summary of potential variances in impacts to bats:

- **Forest habitat removal**: Changes in OnCS-DC location and onshore cable could increase or decrease acreage of forested habitat cleared during construction and increase or decrease the potential impacts depending on the extent of cleared acreage. If tree clearing is required in areas with trees suitable for bat roosting during the period when northern long-eared bats may be present, develop avoidance and minimization measures in coordination with United States Fish and Wildlife Service (USFWS) and NYSDEC and conduct pre-construction habitat surveys.
- **WTG number and size**: Potential collision impacts to bats would decrease with fewer WTGs and increase with a greater number of WTGs; however, if a larger turbine is used to replace each smaller removed turbine to maintain the Project's generating capacity, the overall airspace exposure collision would be nearly identical since the total WTG RSZ area in the proposed Project Area would not appreciably change during operations.
- **Construction timing**: Construction clearing scheduled during the non-active season for bats (December-February) would decrease roosting/foraging impacts to the extent practicable. Variance of impacts would not be expected from construction clearing and operational activities.

3.6.5 Impacts of Alternative B - Proposed Action on Bats

The activities associated with offshore SRWF (94 11-MW WTGs out of 102 potential positions) and SRWEC-OCS/SRWEC-NYS cabling, and OnCS-DC, transmission cable, and interconnection cable with Alternative B include construction and installation, O&M, and decommissioning. These actions have the potential to cause both direct and indirect impacts to bats. The IPFs associated with construction and post-construction O&M activities include land disturbance, lighting, noise, traffic, and presence of structures. These IPFs are thoroughly discussed in the bat assessment prepared for this Project (COP Appendix P1, Stantec 2022). The conclusions of the bat assessment are presented in this section and include consideration of the Project's mitigation and monitoring measures (Appendix H).

3.6.5.1 Construction and Installation

3.6.5.1.1 Onshore Activities and Facilities

Land disturbance: Potential direct impacts to bat species resulting from land disturbance caused by onshore construction include potential habitat loss and direct mortality or injury. Construction of the OnCS-DC would impact up to 4.7 ac (0.019 km^2) of developed land and 2.3 ac (0.009 km^2) of forested land. Tree clearing on the forested land could potentially reduce suitable bat summer foraging and roosting habitat. Mitigation and monitoring measures include seasonal restrictions and vegetation clearing provisions to avoid direct impact to bats. Onshore cable construction would occur primarily during the day in mostly developed onshore locations where bats are not roosting. The Project would reduce the potential impacts to bats by conducting tree clearing from December through February to the extent practicable. If tree clearing is required in areas suitable for northern long-eared bat roosting, the project proponents would develop specific avoidance and minimization measures in coordination with USFWS and NYSDEC and would conduct pre-construction habitat surveys. The potential for construction land disturbance impacts to bats are considered minor, localized, and short-term because of the small area impacted compared to the surrounding regional landscape.

Noise: Noise during daytime/nighttime construction activities has the potential to indirectly impact bats. Bats respond most strongly (awoke from torpor[2]) to colony and vegetation noise and less to traffic noise (Luo et al. 2014). Bats are known to avoid loud noises (Schaub et al. 2008). No bat-specific study has been conducted on HDD noise, but it is expected that their response would be similar to highway noise (COP Appendix P1, Stantec 2022). A recent study noted that bats may be less sensitive to short-term noise threshold shifts than other mammals, and as a result, bats are not expected to experience short-term or permanent hearing loss during construction (Simmons et al. 2016). During the summer when bats are active, construction activity noise may temporarily disrupt or displace bats; however, noise impacts would be minor, localized, and short-term.

Traffic: Most of the construction vehicle activities would occur during bat non-active daytime hours. It is possible that vehicle approaches may disturb bats, particularly near dusk or pre-sunrise times. Direct collision mortality impacts from construction traffic and stationary vehicles would be expected to be rare events as bats use echolocation to avoid objects. Indirect disturbance impacts may occur but would be short-term. The onshore impacts to bats from construction or installation traffic range from negligible to minor and short- to long-term.

Lighting: Nighttime lighting may be used during some of the OnCS-DC construction. Nighttime lighting may attract and concentrate insects and, therefore, attract foraging bats. In addition, the type of lighting

[2] Torpor is a hypometabolic condition associated with low body temperatures. It enables animals to survive periods of unfavorable environmental conditions. Depending on the duration of the hypometabolic state, the torpor can be daily torpor (short-term) or hibernation (long-term). Accessed August 2022. http://www.differencebetween.net/science/difference-between-torpor-and-hibernation/#ixzz7cYmhvsTY

can influence the composition and abundance of insects (Davies et al. 2012). If insects are attracted to construction lighting, then foraging bats in the area may benefit from lighting; however, light associated with collision impacts are not expected because bats use echolocation to avoid structures. The Project would use lighting technology that minimizes impacts on avian bat species to the extent practicable. Onshore light attraction impacts for bats range from to negligible to minor beneficial and short-term during construction and installation of the onshore facilities.

3.6.5.1.2 Offshore Activities and Facilities

Noise: Offshore construction noise could result in avoidance or displacement, but these impacts are expected to be short-term due to the known limited use of offshore areas by bats during spring and fall migration periods (Refer to Section 3.6.1). Additionally, noise associated with construction and installation is not expected to impact bats over the long term as they can habituate to repeated noise (Luo et al. 2014). Therefore, the overall impact of construction noise to bats would be short-term and minor.

Traffic: Construction and support vessels are expected to be present during construction and installation. Direct collision mortality impacts from construction and support vessels would be expected to be rare events since bats use echolocation to avoid objects, and the speed of vessel traffic is expected to be relatively slow. Support vessels present during construction and installation operations may provide artificial roosting sites for bats and aid in energy conservation. In addition, bats may benefit from lighted vessels and platforms which can attract insects and provide foraging opportunities. Overall, impacts related to construction and installation traffic would be short-term and negligible to minor with negligibly beneficial impacts.

Lighting: Lighting impacts to bats have been previously discussed in the onshore activities and facilities construction and installation section. These impacts identified are expected to be the same but of longer duration. Lighting impacts may be negligible to negligibly beneficial over the short term for bats through concentration of their prey base and improved foraging opportunities.

3.6.5.2 Operations and Maintenance

3.6.5.2.1 Onshore Activities and Facilities

Land disturbance: During the O&M phase of the Project, the only sources of land disturbance are expected to be routine maintenance of facilities and potential repair actions; however, no new facilities would be constructed, no additional habitat would be disturbed during O&M, and effects to bats would be negligible.

Noise: Operational noise associated with the OnCS-DC is not expected to impact bats as they can habituate to repeating noise disturbances (Luo et al. 2014).

Traffic: Collision impacts with the OnCS-DC are not expected as bats echolocate to avoid structures.

Lighting: Nighttime lighting may be used on the OnCS-DC facilities. Nighttime lighting may attract and concentrate insects and, therefore, attract foraging bats. If insects are attracted to construction lighting, then foraging bats in the area may benefit from lighting; however, light associated with collision impacts are not expected because bats use echolocation to avoid structures. The Project would use lighting technology that minimizes impacts on avian bat species to the extent practicable. Onshore light attraction impacts for bats range from to negligible to negligibly beneficial and long-term during construction and installation of the onshore facilities.

3.6.5.2.2 Offshore Activities and Facilities

Noise: Operational noise associated WTGs is not expected to impact bats as they can habituate to repeating noise disturbances (Luo et al. 2014).

Traffic: Maintenance vessels would be present and operating during offshore O&M activities. Direct collision mortality impacts would be expected to be rare events. Indirect disturbance impacts may occur but would be short-term. The impacts to bats from O&M vessel traffic would be localized, minor, and intermittent. Support vessels present during O&M activities may provide artificial roosting sites for bats and provide a negligible beneficial effect in energy conservation. In addition, bats may benefit from lighted vessels that may attract insects and provide foraging opportunities. Collision with vessels is unlikely as bats use echolocation to avoid structures. Overall, impacts related to vessel traffic during O&M would be negligible to negligibly beneficial and short-term.

Lighting: Lighting on WTGs would be limited to navigational lighting. Due to their offshore location and the intermittent operation of navigational lighting, WTG lighting is not anticipated to provide increased insect abundance and is, therefore, expected to have no impact to bats.

Presence of structures: Although adverse impacts to bats resulting from collision mortality cannot be quantified based on existing studies, some level of mortality is expected during operations at offshore wind facilities (Solick and Newman 2021). Any new operating facility would require a thorough regulatory and environmental review to avoid, minimize, and mitigate adverse impacts to bats. Outside of migration, bats are infrequently found offshore. In addition, the proposed 1.0-nm (1.9-km) spacing between WTG structures with the SRWF would reduce collision exposure risk. Bats use echolocation to effectively avoid collisions with visible infrastructure. Bat collision impacts with stationary infrastructure would be rare, unexpected occurrences. Individual migratory bats would pass through the RSZ or pass by wind development sites with only slight course corrections.

For ESA-listed (or proposed) bat species, BOEM (2022) analyzed the potential for impacts to northern long-eared bat, little brown bat, and tricolored bat. Several studies have been conducted to evaluate the presence of bats offshore in the region where the SRWF would be constructed (ESS Group Inc. 2014; Pelletier et al. 2013; Peterson and Pelletier 2016, Stantec 2018c). Northern long-eared bats have not been detected offshore in the Project Area, while little brown bats are expected to fly below the RSZ, eliminating the risk of blade strike. Tricolored bats generally migrate distances less than 31 mi (50 km),

and forage less than 4 mi (6.4 km) from their roosts. This short flight range prohibits their presence in the SRWF area.

While the collision potential for individual bat fatalities exists from WTG operational activities, it is unlikely to impact bat populations since offshore bat occurrence and abundance is expected to be low. As a result, adverse impacts to bats from collision would be negligible to minor and long-term.

3.6.5.3 Conceptual Decommissioning

3.6.5.3.1 Onshore Activities and Facilities

Land disturbance: Land disturbance would be negligible since no new land would be disturbed during the process.

Noise: Noise impacts to bats would be the same or less than those described for construction activities. Onshore impacts to bats would range from negligible to minor and short-term during decommissioning.

Traffic: Traffic impacts to bats would be the same or less than those described for construction activities. Bats would avoid visible infrastructure with echolocation. Onshore impacts to bats would range from negligible to minor and short-term during decommissioning.

Lighting: Lighting impacts to bats would be similar to those described for the construction activities. Lighting impacts would be expected to range from negligible to negligibly beneficial from increased prey availability due to nighttime lighting.

3.6.5.3.2 Offshore Activities and Facilities

Noise: Noise impacts to bats would be the same or less than those described for construction activities. Bats would avoid lighted areas and visible infrastructure with echolocation. Noise impacts to bats would be negligible to minor and short-term during decommissioning.

Traffic: Construction and support vessels are expected to be present during conceptual decommissioning activities. Direct collision mortality impacts from construction and support vessels would be expected to be rare events since bats use echolocation to avoid objects, and the speed of the vessel traffic is slow. Support vessels present during decommissioning may provide artificial roosting sites for bats and aid in energy conservation. Overall, impacts related to decommissioning would be negligible and short-term.

Lighting: Lighting impacts to bats have been previously discussed in the construction and installation section. These impacts identified are expected to be similar or less than for conceptual decommissioning due to a shorter overall expected duration of these activities. Lighting impacts may be negligible to beneficially minor for bats through concentration of their prey base and improved foraging opportunities.

3.6.5.4 Impacts of Alternative B on ESA-Listed Species

Based on the information contained in this document, BOEM anticipates that the Proposed Action is likely to result in negligible adverse impacts to the northern long-eared, little brown, and tricolored bats.

3.6.5.5 Cumulative Impacts of the Proposed Action

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on bats through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration is anticipated to be infrequent and limited and given that cave bats do not typically occur on the OCS, offshore wind activities would not appreciably contribute to impacts on bats. Short-term disturbance and permanent loss of onshore habitat may occur as a result of constructing onshore infrastructure such as onshore substations and onshore export cables for offshore wind development. However, habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the GAA.

3.6.5.6 Conclusions

Impacts of the Proposed Action

Project construction and installation, O&M, and conceptual decommissioning would cause impacts from the following IPFs: land disturbance, noise, traffic, lighting, and the presence of structures. BOEM anticipates the impacts resulting from the Proposed Action alone would range from negligible to minor adverse impacts. Therefore, BOEM expects the overall impact on bats from the Proposed Action alone to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

Cumulative Impacts of the Proposed Action

In the context of other reasonably foreseeable environmental trends and planned actions, the incremental impacts under the Proposed Action resulting from individual IPFs would range from negligible to minor impacts over both the short- and long-term, depending on the species. Considering all the IPFs together, BOEM anticipates that the overall cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **minor** adverse impacts to bats. Even though the overall effect would be detectable and measurable, the impacts to individuals and their habitats would not lead to population-level effects.

3.6.6 Alternative C-1 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

Under Alternative C-1, the same number of WTGs (up to 94 WTGs) under the Proposed Action may be approved by BOEM; however, 8 WTG potential positions from Priority Area 1 along the northern boundary of the Lease Area would be excluded from consideration (Figure 2.1-7). The WTG positions to be removed from Priority Area 1 were selected to maximize the largest contiguous complex habitat area feasible and/or to reduce the number of 11-MW WTGs located near presumed Atlantic cod spawning location(s). This alternative would not significantly alter the construction methods, O&M, or conceptual decommissioning of the Project. This alternative would not increase the impact level or likelihood of impacts for bats as compared to the Proposed Action. Therefore, Alternative C-1 would be expected to have negligible to moderate impacts on bats from construction and installation, O&M, and conceptual decommissioning activities.

3.6.6.1 Construction and Installation

3.6.6.1.1 Onshore Activities and Facilities

Onshore impacts to bats would be the same as those described for the Proposed Action. Onshore impacts to bats would be minor and short-term.

3.6.6.1.2 Offshore Activities and Facilities

Offshore impacts to bats would be the same as those described for the Proposed Action. Offshore impacts to bats would be minor and long-term.

3.6.6.2 Operations and Maintenance

3.6.6.2.1 Onshore Activities and Facilities

Onshore impacts would be the same as described for the Proposed Action. Onshore impacts to bats would be minor and long-term.

3.6.6.2.2 Offshore Activities and Facilities

Offshore impacts would be the same as described for the Proposed Action. Offshore impacts to bats would be negligible to minor and long-term.

3.6.6.3 Conceptual Decommissioning

3.6.6.3.1 Onshore Activities and Facilities

Onshore impacts would be the same as described for the Proposed Action. Onshore impacts to bats would be minor and short-term.

3.6.6.3.2 Offshore Activities and Facilities

Offshore impacts would be the same as described for the Proposed Action. Offshore impacts to bats would be minor and short-term.

3.6.6.4 Cumulative Impacts of Alternative C-1

The cumulative impacts of Alternative C-1 considered the impacts of this alternative in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on bats through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration is anticipated to be infrequent and limited and given that cave bats do not typically occur on the OCS, offshore wind activities would not appreciably contribute to impacts on bats. Short-term disturbance and permanent loss of onshore habitat may occur as a result of constructing onshore infrastructure such as onshore substations and onshore export cables for offshore wind development. However, habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the GAA.

The cumulative impacts on bats would likely be negligible because the occurrence of bats offshore is low, and onshore habitat loss is expected to be minimal. In context of reasonably foreseeable environmental trends, Alternative C-1 would contribute an undetectable increment to the cumulative noise, presence of structures, and land disturbance impacts on bats.

3.6.6.5 Impacts of Alternative C-1 on ESA-Listed Species

Based on the information contained in this document, BOEM anticipates that Alternative C-1 is likely to result in negligible adverse impacts to the northern long-eared, little brown, and tricolored bats.

3.6.6.6 Conclusions

Impacts of Alternative C-1

Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for bats. Therefore, the conclusions for impacts of Alternative C-1 are the same as described under the Proposed Action (Alternative B). BOEM expects the overall impact on bats to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

Cumulative Impacts of Alternative C-1

Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for bats. Therefore, the conclusions for cumulative impacts of Alternative C-1 are the same as described under the Proposed Action (Alternative B). BOEM expects the overall cumulative impact on bats to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

3.6.7 Alternative C-2 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

Alternative C-2 differs from Alternative B (Proposed Action) only with the location of the WTGs. WTGs initially planned for the western side of the Project would be moved to an open area on the eastern side of proposed Project Area to minimize impacts to fisheries habitat. Onshore and offshore construction and installation, O&M, and conceptual decommissioning impacts would be the same as described for Alternative B.

3.6.7.1 Construction and Installation

3.6.7.1.1 Onshore Activities and Facilities

Onshore impacts to bats would be the same as those described for Alternative B. Onshore impacts to bats would be minor and short-term.

3.6.7.1.2 Offshore Activities and Facilities

Offshore impacts to bats would be the same as those described for Alternative B. Offshore impacts to bats would be minor and long-term.

3.6.7.2 Operations and Maintenance

3.6.7.2.1 Onshore Activities and Facilities

Onshore impacts would be the same as described in Alternative B. Onshore impacts to bats would be minor and long-term.

3.6.7.2.2 Offshore Activities and Facilities

Offshore impacts would be the same as described in Alternative B. Offshore impacts to bats would be negligible to minor and long-term.

3.6.7.3 Conceptual Decommissioning

3.6.7.3.1 Onshore Activities and Facilities

Onshore impacts would be the same as described in Alternative B. Onshore impacts to bats would be minor and short-term.

3.6.7.3.2 Offshore Activities and Facilities

Offshore impacts would be the same as described in Alternative B. Offshore impacts to bats would be minor and short-term.

3.6.7.4 Cumulative Impacts of Alternative C-2

The cumulative impacts of Alternative C-2 considered the impacts of this alternative in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on bats through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration is anticipated to be infrequent and limited and given that cave bats do not typically occur on the OCS, offshore wind activities would not appreciably contribute to impacts on bats. Short-term disturbance and permanent loss of onshore habitat may occur as a result of constructing onshore infrastructure such as onshore substations and onshore export cables for offshore wind development. However, habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the GAA.

The cumulative impacts on bats would likely be negligible because the occurrence of bats offshore is low, and onshore habitat loss is expected to be minimal. In context of reasonably foreseeable environmental trends, Alternative C-2 would contribute an undetectable increment to the cumulative noise, presence of structures, and land disturbance impacts on bats.

3.6.7.5 Impacts of Alternative C-2 on ESA-Listed Species

Based on the information contained in this document, BOEM anticipates that Alternative C-2 is likely to result in negligible adverse impacts to the northern long-eared, little brown, and tricolored bats.

3.6.7.6 Conclusions

Impacts of Alternative C-2

Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for bats. Therefore, the conclusions for impacts of Alternative C-2 are the same as described under the Proposed Action (Alternative B). BOEM expects the overall impact on bats to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

Cumulative Impacts of Alternative C-2

Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for bats. Therefore, the conclusions for cumulative impacts of Alternative C-2 are the same as described under the Proposed Action (Alternative B). BOEM expects the overall cumulative impact on bats to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

3.6.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.6.8.1 Construction and Installation

3.6.8.1.1 Onshore Activities and Facilities

Onshore impacts to bats would be the same as those described for Alternative B. Onshore impacts to bats would be minor and short-term.

3.6.8.1.2 Offshore Activities and Facilities

Offshore impacts to bats would be the same as those described for Alternative B. Offshore impacts to bats would be minor and long-term.

3.6.8.2 Operations and Maintenance

3.6.8.2.1 Onshore Activities and Facilities

Onshore impacts would be the same as described in Alternative B. Onshore impacts to bats would be minor and long-term.

3.6.8.2.2 Offshore Activities and Facilities

Offshore impacts would be the same as described in Alternative B. Offshore impacts to bats would be negligible to minor and long-term.

3.6.8.3 Conceptual Decommissioning

3.6.8.3.1 Onshore Activities and Facilities

Onshore impacts would be the same as described in Alternative B. Onshore impacts to bats would be minor and short-term.

3.6.8.3.2 Offshore Activities and Facilities

Offshore impacts would be the same as described in Alternative B. Offshore impacts to bats would be minor and short-term.

3.6.8.4 Cumulative Impacts of Alternative C-3

The cumulative impacts of Alternative C-3 considered the impacts of this alternative in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on bats through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration is anticipated to be infrequent and limited and given that cave bats do not typically occur on the OCS, offshore wind activities would not appreciably contribute to impacts on bats. Short-term disturbance and permanent loss of onshore habitat may occur as a result of constructing onshore infrastructure such as onshore substations and onshore export cables for offshore wind development. However, habitat removal is anticipated to be minimal, and any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the GAA.

The cumulative impacts on bats would likely be negligible because the occurrence of bats offshore is low, and onshore habitat loss is expected to be minimal. In context of reasonably foreseeable environmental trends, Alternative C-3 would contribute an undetectable increment to the cumulative noise, presence of structures, and land disturbance impacts on bats.

3.6.8.5 Impacts of Alternative C-3 on ESA-Listed Species

Based on the information contained in this document, BOEM anticipates that Alternative C-3 is likely to result in negligible adverse impacts to the northern long-eared, little brown, and tricolored bats.

3.6.8.6 Conclusions

Impacts of Alternative C-3

Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for bats. Therefore, the conclusions for impacts of Alternative C-3 are the same as described under the Proposed Action (Alternative B). BOEM expects the overall impact on bats to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

Cumulative Impacts of Alternative C-3

Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for bats. Therefore, the conclusions for cumulative impacts of Alternative C-3 are the same as described under the Proposed Action (Alternative B). BOEM expects the overall cumulative impact on bats to be **minor** adverse, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.

3.6.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall minor adverse impacts on bats. Table 3.6-2 provides an overall summary of alternative impacts.

Table 3.6-2. Comparison of Alternative Impacts on Bats

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: Ongoing activities associated with Alternative A would be **minor** adverse**.** *Cumulative Impacts of the No Action Alternative:* Considering all the IPFs together, BOEM anticipates that the overall cumulative impacts associated with past, present, and reasonably foreseeable activities would result in **minor** impacts to bats. Even though the overall effect would be detectable and measurable, the impacts to individuals and their habitats would not lead to population-level effects.	*Proposed Action:* BOEM anticipates the impacts resulting from the Proposed Action alone would be **minor** adverse impacts. Therefore, BOEM expects the overall impact on bats from the Proposed Action to be **minor**, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects. *Cumulative Impacts of the Proposed Action:* Considering all the IPFs together, BOEM anticipates that the overall cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **minor** impacts to bats. Even though the overall	*Alternative C-1:* Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for bat compared to the Proposed Action. BOEM expects the overall impact on bats to be **minor**, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects. *Cumulative Impacts of Alternative C-1:* Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for bat compared to the Proposed Action. The conclusions for cumulative impacts of Alternative C-1 are the same as described under the Proposed Action. BOEM expects the	*Alternative C-2*: Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for bats. BOEM expects the overall impact on bats to be **minor**, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects. *Cumulative Impacts of Alternative C-2:* Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for bats. The conclusions for cumulative impacts of Alternative C-2 are the same as described under the Proposed Action. BOEM expects the overall cumulative impact on bats to be **minor**, as the overall effect would be	*Alternative C-3:* Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for bats. BOEM expects the overall impact on bats to be **minor**, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects. *Cumulative Impacts of Alternative C-3:* Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for bats. The conclusions for cumulative impacts of Alternative C-3 are the same as described under the Proposed Action. BOEM expects the overall cumulative impact on bats to be **minor**, as the overall effect would be

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
	effect would be detectable and measurable, the impacts to individuals and their habitats would not lead to population-level effects.	overall cumulative impact on bats to be **minor**, as the overall effect would be measurable but the impacts to individuals and their habitats would not lead to population-level effects.	measurable but the impacts to individuals and their habitats would not lead to population-level effects.	measurable but the impacts to individuals and their habitats would not lead to population-level effects.

3.6.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative which would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Although Alternative C-3b would reduce the number of WTGs, the presence of WTGs could still increase the potential for collision, albeit at lower levels than the Proposed Action. The reduction in effects from impacts would not result in different impact level determinations. These adverse impacts would be avoided and minimized using the same APMs as described in the Proposed Action (see Table 3.6-3). BOEM expects the overall impacts of these alternatives to bats would be similar to the Proposed Action: **minor** adverse.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that Alternative C-3b's contribution to cumulative impacts would be similar to the Proposed Action (ranging from negligible to minor adverse). The overall impacts of Alternative C-3b when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **minor** adverse.

3.6.11 Proposed Mitigation Measures

The mitigation measures listed in Table 3.6-3 are recommended for inclusion in the Preferred Alternative.

Table 3.6-3. Proposed Mitigation Measures: Bats

Measure	Description	Effect
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 would be addressed through monitoring; and describes methods and time frames for data collection, analysis, and reporting. Sunrise Wind would engage with federal and state agencies and eNGOs to identify appropriate monitoring options and technologies, and to facilitate acceptance of the final plan.	If the reported post-construction bat monitoring results indicate bat impacts deviate substantially from the impact analysis included in this EIS, then Sunrise Wind must make recommendations for new mitigation measures or monitoring methods.
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 would commit to deploying these technologies.	If monitoring reveals that impacts to bats are non-negligible, Sunrise Wind would employ minimization strategies and deterrent technologies.
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.	Reduces anthropogenic lighting effects to bat species.
ADLS or related dimming or shielding	Sunrise Wind LLC 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 the FDR/FIR approval, and dialogue with stakeholders.	Reduces anthropogenic lighting effects to bat species.
Time-of-year restrictions	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.	Reduces construction impacts to bat species.
Time-of-year restrictions	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 LLC will consult with NYSDEC and USFWS, if applicable, regarding impacts to RTE avian species.	Reduces construction impacts to bat species.

Incidental mortality reporting	• Sunrise Wind LLC must provide an annual report to BOEM, BSEE, and the Service documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with federal or research bands must be reported to the USGS Bird Band Laboratory, available at https://www.pwrc.usgs.gov/BBL/bblretrv/. • Incidental observations are extremely unlikely to document any fatalities of listed birds that may occur due to 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 ESA-listed bird or bat must be reported to BOEM, the BSEE, and the Service 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.	
Protection of northern long-eared bats	i. No Project component shall be sited or located within 150 feet of any known northern long-eared bat maternity roost, or within 0.25 mile of any known northern long-eared bat hibernaculum. ii. No tree clearing activities shall occur at any time within 150 feet of any NLEB maternity roosts or 0.25 mile of any NLEB hibernacula. All tree clearing activities occurring greater than these distances but within 1.5 miles of a NLEB detection or 5 miles 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	Recues adverse impacts to northern long-eared bats.

	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 feet 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 DPS 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 DPS staff that satisfies the requirements of 6 NYCRR Part 182.	

3.6.11.1 Effect of Measures Incorporated into the Preferred Alternative

The mitigation measures listed in Table 3.6-3 are recommended for inclusion in the Preferred Alternative. These measures include adaptive mitigation. These measures, if adopted, would have the effect of further reducing the overall impact from the Preferred Alternative.

3.8 Birds

This section discusses potential impacts on birds from the proposed Project, alternatives, and future offshore wind activities in the GAA (Appendix D, Figure D-5). The bird GAA, as depicted in Appendix D, includes the United States eastern coast from Maine to Florida extending from 0.5 mi (0.8 km) onshore to cover Project component sites and 100 mi (161 km) offshore.

3.8.1 Impact Level Definitions for Birds

This Final EIS uses a four-level classification scheme to analyze potential impact levels on birds from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.8-1 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for birds. Table G-7 in Appendix G (*Impact-Producing Factor Tables*) identifies potential IPFs, issues, and indicators to assess impacts to birds.

Table 3.8-1. Definition of Potential Adverse and Beneficial Impact Levels for Birds

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	Impacts on individual birds and/or their habitat, if any, would be at the lowest levels of detection and barely measurable, with no perceptible consequences to individuals or the population.	Impacts on individual birds and/or their habitat would be beneficial but at the lowest levels of detection and barely measurable.
Minor	Impacts on birds are detectable and measurable but are low intensity, highly localized, and short-term in duration. Impacts on individuals and/or their habitat do not lead to population-level effects.	Impacts on individual birds and/or their habitat are detectable and measurable. The effects are likely to benefit individuals, be localized, and/or be short-term and are unlikely to lead to population-level effects.
Moderate	Impacts on birds and/or their habitat are detectable and measurable; they are of medium-intensity, can be short- or long-term, and can be localized or extensive. Impacts on individuals and/or their habitat could have population-level effects, but the population can sufficiently recover from the impacts or enough habitat remains functional to maintain the viability of the species both locally and throughout their range.	Impacts on individual birds and/or their habitat are detectable and measurable. These benefits may affect large areas of habitat, be long-term, and/or affect a large number of individuals and may lead to a detectable increase in populations but is not expected to improve the overall viability or recovery of affected species or population.
Major	Impacts on individual birds and/or their habitat detectable and measurable; they are of severe intensity, can be long-lasting or permanent, and are extensive. Impacts to individuals and/or their habitat would have severe population-level effects and compromise the viability of the species.	Impacts on individual birds and/or their habitat are detectable and measurable. These impacts on habitat may be short-term, long-term, or permanent and would promote the viability of the affected species/population and/or increase the affected species/population levels.

3.8.2 Description of the Affected Environment and Future Baseline Conditions

Several avian species groups occur seasonally within or in proximity to the onshore and offshore portions of the Project Area and the GAA, which extends from 0.5 mi (0.8 km) inland to 100 mi (161 km) offshore along the United States coast from Maine to Florida (Appendix D). Situated within the Atlantic Flyway, the Project Area is located within one of four major North American north-south migration routes for many species of seabirds, shorebirds and waterfowl, raptors, and songbirds (Menza et al. 2012). This flyway is an important migratory pathway for up to 164 species of marine/coastal waterbirds and a similar number of land birds with the majority using this pathway annually migrating between wintering and breeding grounds (Watts 2010; NYSDEC 2007; Veit et al. 2016; Normandeau and APEM 2021). Both the coastal and marine environments along the Atlantic Flyway provide important resources for hundreds of these avian species at migration stopover sites, as well as breeding locations, and wintering areas (Menza et al. 2012). Birds use a wide variety of habitats (e.g., forests, grasslands, riparian corridors, lakes, wetlands, coastal shorelines, and offshore marine waters) for breeding, foraging, and roosting.

During migration waterbirds using the Atlantic Flyway typically fly between the coast and several kilometers out onto the OCS, whereas land birds tend to use a wider corridor extending from the coastline to tens of kilometers inland. Although both groups may occur over land or water within the flyway and may extend considerable distances from shore, the highest diversity and density are centered near the shoreline (Watts 2010). COP Tables 4.4.6.1, 4.4.6-2, 4.4.6-3, and 4.4.6-4 (COP, Section 4.4.6; Sunrise Wind 2023) list the timing; distribution; and status of marine, coastal, and land bird taxonomic groups and species that may occur within or proximate to the OnCS-DC and the offshore SRWEC-NYS, SRWEC-OCS, and SRWF Project areas, and are incorporated here by reference.

3.8.2.1 General Distribution OnCS-DC and SRWEC-NYS

Many species of waterfowl, shorebirds, waders, raptors, songbirds, and seabirds may occur at the onshore facilities areas, along the nearshore SRWEC-NYS cable route, and in the adjacent surrounding region on Fire Island, a barrier island that runs parallel to Long Island. Located within the North Atlantic Coast Ecoregion of New York (NYSDEC 2022), terrestrial/aquatic bird habitats of the onshore portions of the Project Area include forests, grasslands, developed areas, beaches, and surface waters such as wetlands, lakes, ponds, rivers.

Many birds use coastal and marine habitats year-round, particularly waterfowl, shorebirds, and other wading birds. Waterfowl such as geese and ducks and wading birds such as herons and egrets typically utilize inland, coastal, and wetland habitats during overwintering or summer breeding, and only occur offshore during migration (Sunrise Wind 2023). Most shorebirds breed and forage along coastal beaches and, other than the uniquely marine phalaropes, only occur offshore during migration.

Colonial seabird and piping plover (*Charadrius melodus*) surveys on coastal Long Island have reported active breeding sites for the least tern (*Sternula antillarum*), common tern (*Sterna hirundo*), Forster's

tern (*Sterna forsteri*), black skimmer (*Rynchops niger*), and gull-billed tern (*Gelochelidon nilotica*) (Jennings 2018). Pied-billed grebe (*Podilymbus escrys*) may breed at locations in the vicinity of the onshore transmission cable/interconnection cable (NYSDEC 2007). Each of these species has the potential to utilize resources at or adjacent to the onshore facilities as foraging, nesting, or migrating habitat. The NYSDEC has indicated that terns have historically nested on dredged material adjacent to the Smith Point Marina parking lot (see COP, Section 4.4.6; Sunrise Wind 2023).

Land birds using the surrounding coastal region include songbirds and raptors. A variety of these passerines and other birds migrate along the Atlantic coast and could fly over the Project Area (particularly onshore facilities, the nearshore SRWEC-NYS cable route, and landing sites during migration and may utilize stopover sites and staging areas along the coast. Songbirds breed in onshore habitats during summer and are only present offshore during spring and fall migrations. Raptors, including accipiters, buteos, and harriers, may breed and forage in upland habitats and pass through the area during spring and fall migration. Falcons, osprey, and eagles may utilize coastal areas to breed, forage, and migrate (Sunrise Wind 2023). The New York State Breeding Bird Atlas 2000-2005 survey results indicated that the northern harrier (*Circus hudsonius*) may breed at locations in the vicinity of the onshore transmission cable/interconnection cable (NYSDEC 2007). Northern harriers may also occur along the shoreline to hunt for avian and rodent prey from spring through fall (Smith et al. 2020).

3.8.2.2 General Distribution SRWEC-OCS and SRWF

The SRWF would be situated on the OCS in waters ranging in depth from 114 to 203 ft (35 to 62 m) and located approximately 30.5 mi (49.1 km) east of Montauk, New York and 16.7 mi (26.8 km) from Block Island, Rhode Island (COP, Appendix G1; Sunrise Wind 2022). Various fish, crustaceans, and other zooplankton are available in this offshore area as prey for diving birds at different depths, including the benthos. A total of 83 marine bird species are known to regularly occur off the eastern seaboard of the United States (Nisbet et al. 2013). The diversity of marine bird species that use the Project Area and surrounding region is due in part to its location within the Mid-Atlantic Bight, a region where species that breed in both the Northern and Southern Hemispheres overlap (BOEM 2022a). Bird groups expected to use deeper offshore waters within the GAA at least seasonally or year-round include loons, shearwaters, fulmars, storm-petrels, gannets, sea ducks, jaegers, gulls, terns, and alcids (COP, Appendix P1; Stantec 2022b).

The SRWEC-OCS is located within federal offshore waters of the OCS where a variety of marine birds and/or non-marine migratory bird species are expected to be comparable to those described for the SRWF. Birds known to occur near NYS waters include terns, gulls, cormorants, and shorebirds during summer and sea ducks, dabbling ducks, loons, grebes, alcids, and migrating passerines during spring and summer migrations and winter. Other more pelagic species that could occur include the Cory's shearwater (*Calonectris borealis*), northern gannet (*Morus bassanus*), and black-legged kittiwake (*Rissa tridactyla*) (Sunrise Wind 2023).

3.8.2.3 Endangered Species Act-Listed Species

Species that are federally designated as Threatened or Endangered under the ESA and that may occur in any portion of the Project Area include the piping plover (threatened), rufa red knot (*Calidris canutus rufa*; threatened; USFWS 2021a), and roseate tern (*Sterna dougallii*; endangered). The black-capped petrel (*Pterodroma hasitata*) has been proposed for listing and could potentially occur in the region; however, this species is generally associated with waters deeper than the nearshore waters utilized by the three currently listed species (USFWS 2019).

No ESA-defined critical habitat is currently designated for ESA-listed birds in or near the Project Area. Critical habitat for the rufa red knot has been proposed and encompasses 649,066 ac (2,626.7 km^2) from Massachusetts to Texas. The portion of proposed critical habitat near the Project Area is on southern Long Island and includes 1,001 ac (4.05 km^2) in Moriches Inlet, Sussex County; 1,821 ac (7.37 km^2) in Jones Inlet, Nassau County; and 5,458 ac (22.09 km^2) in Jamaica Bay, Queens County (USFWS 2021a, 2021b).

Piping Plover: Piping plovers nest on sandy beaches near the Project Area and pass through the region during spring and fall migrations. They are present in the region from March to September and nest on beaches on Long Island from April through August (NYSDEC 2017). Results of the 2018 Long Island colonial waterbird surveys found 82 active piping plover breeding sites and 404 breeding pairs along the coast and barrier islands (Jennings 2018). Fire Island at Smith Point County Park had 25 breeding pairs of piping plover in 2018 (Jennings 2018). Piping plover nests have been documented within the Great South Bay area (NYSERDA 2017b). Although offshore flights of piping plovers are believed to be infrequent, telemetry data indicate that the potential exists for this species to infrequently fly over the SRWF (COP, Appendix P1; Stantec 2022b).

Rufa Red Knot: This shorebird undertakes long-distance migratory flights (up to 5,000 mi [8,000 km]; Baker et al. 2013) between breeding grounds in the Arctic and wintering grounds in the southeastern United States, Caribbean, northern Brazil, and Argentina (Tierra del Fuego) (Baker et al. 2013). The red knot may be present along the United States East Coast, including New York, Rhode Island, and Massachusetts, during spring and fall migratory periods (NYSERDA 2017a); the rufa subspecies' primary stopover during spring migration is Delaware Bay (Niles et al. 2009). Red knots may stopover to forage in salt meadows and mudflats of the South Shore of Long Island (NYSDEC 2014a) and may stopover to forage in intertidal areas and roost on beach habitats near the landfall/ICW work area at Smith Point. While primarily a terrestrial or coastal migrant, telemetry data indicate that the potential exists for this species to infrequently fly over the SRWF (COP, Appendix P1; Stantec 2022b).

Roseate Tern: This species of seabird breeds in colonies on coastal islands of the northeastern Atlantic coast and Atlantic Canada and winters in South America (Gochfeld and Burger 2020; USFWS 2010). Roseate terns migrate through the Project Area region on their way to coastal breeding sites in New England and Atlantic Canada and breed on small islands as far south as Long Island (NYSDEC 2014b). Ninety percent of the roseate tern population breeds in the Cape Cod-Long Island area (within 150 nm

of the Fire Island landing site) on rocky coastal islands, outer beaches, or salt marsh islands with protective vegetation to conceal nests (USFWS 2001; Veit and Petersen 1993). On Long Island, most breeding pairs nest on Great Gull Island (Jennings 2018; NYSDEC 2014b; NYSERDA 2017a), which is located off the eastern end of the North Fork of Long Island (approximately 50 mi from the Fire Island landing site). Results of the 2018 Long Island colonial seabird surveys found over 2,000 roseate tern breeding pairs on Great Gull Island (Jennings 2018), approximately 48 mi (77 km) east-northeast of Smith Point Park. Roseate terns have historically nested along the barrier beach at Fire Island National Seashore (NYSERDA 2017a) and potentially in the vicinity of the cable landfall location at Smith Point County Park (NPS 2018; Peters 2008), and they may forage over shallow waters or loaf in the area. Fire Island Inlet, approximately 25 mi (40 km) west-southwest of Smith Point County Park, has also provided important foraging habitat (Peters 2008). Roseate terns may be found offshore, but occurrence, frequency and number of roseate terns would be expected to be relatively low there (COP, Appendix P1; Stantec 2022b).

3.8.2.4 Non-ESA-Listed Species

Several other birds that are not federally listed but are designated by individual states as threatened, endangered, or otherwise vulnerable are likely to occur in the Project Area. State-listed bird species documented or potentially present in the offshore SRWF and SRWEC-OCS/SRWEC-NYS cable routes and onshore facilities include the state-threatened northern harrier, bald eagle (*Haliaeetus leucocephalus*), least tern, and common tern (Table 5, Stantec 2018a). Bald eagles were delisted from their endangered ESA status in August 2007 but are still federally protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Suitable bald eagle habitat on Long Island is limited near onshore Project components (Stantec 2018a), but one bald eagle nest has been recorded in the Wertheim National Wildlife Refuge, approximately 1.5 mi from onshore Project components (USFWS 2022a).

3.8.3 Impacts of Alternative A – No Action on Birds

When analyzing the impacts of the No Action Alternative on birds, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities on the baseline conditions for birds. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E.

3.8.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for birds described in Section 3.8, *Affected Environment* would continue to follow current regional trends and respond to IPFs introduced by ongoing non-offshore wind and offshore wind activities. Ongoing non-offshore wind activities within the GAA that contribute to impacts to birds are generally associated with onshore and offshore construction and climate change. Onshore construction activities and associated impacts are expected to continue along current trends and have the potential to affect bird species through short-term and permanent

habitat removal and noise impacts that could cause avoidance behavior and displacement. Bird strikes would continue to be an additional risk associated with ongoing wind projects. Mortality of individual birds is likely to occur, but population-level effects are not anticipated. Impacts associated with climate change have the potential to reduce reproductive output and increase individual mortality and disease occurrence.

Ongoing offshore wind activities within the GAA that contribute to impacts on birds include:

- Continued O&M of the Block Island project (5 WTGs) installed in state waters;
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Fork projects would affect birds through the primary IPFs of noise, presence of structures, and land disturbance. Ongoing offshore wind activities would have the same type of impacts from noise, presence of structures, and land disturbance that are described in detail in following section for planned offshore wind activities, but the impacts would be of lower intensity.

3.8.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on birds through the primary IPFs of noise, presence of structures, land disturbance, and bird strike. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Other future non-Project activities other than offshore wind development activities that may affect birds include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (Refer to Appendix E for a description of ongoing and planned activities).

A general description of the IPFs that could occur in the GAA from future planned offshore wind development activities is provided in the following section.

Seafloor disturbance/Sediment suspension and deposition: Localized, short-term seabed disturbance and associated increased suspended sedimentation could occur during construction of future planned

wind farm cables (see Appendix E). Elliott et al. (2017) monitored TSS levels during construction of the BIWF. The observed TSS levels were far lower than levels predicted by the reference model, dissipating to baseline levels less than 50 ft (15.2 m) from the disturbance. Both the modeled TSS effects, which are conservatively high, and the observed TSS effects were short-term and within the range of baseline variability; however, these effects would be short-term (lasting only a few tide cycles) due to the low mobility of sediments (primarily sand) in cable and foundation installation areas (Stantec 2020). Disturbed seafloor from construction of future offshore wind projects may affect diving birds' foraging success due to reduced visibility from suspended sediments or may affect some prey species (e.g., benthic assemblages), although impacts to prey in the Project Area vicinity are expected to be short-term and local. Forage fish may become less visible for diving birds and benthic organisms (e.g., mollusks) may be less visible for diving sea ducks. Suspended sediment concentrations during activities other than dredging would, however, remain within 9.8-ft (3-m) of the seabed, and turbidity levels would return to ambient levels in less than 1 hour (see Appendix H). Birds would be able to successfully forage in adjacent areas and would not be expected to be affected by increased suspended sediments. Therefore, impacts would be minor, and no population-level effects on birds would occur.

Noise: Construction noise (i.e., pile driving) from 29 projected offshore wind projects anticipated between 2022 to 2030 (Bennun et al. 2021) along with geophysical and geotechnical (G&G) surveys and vessel traffic could increase underwater and airborne noise levels. Preliminary studies on bird behavior indicated that seabirds may exhibit avoidance behaviors in response to underwater noises (Hansen et al. 2020). Underwater noise may cause behavioral changes in some diving or swimming birds, ranging from mild annoyance to escape behavior, which could affect foraging in feeding habitats adjacent to foundation piles (BOEM 2014; BOEM 2016). Potential impacts could be greater if avoidance and displacement of birds occurred during staging, when birds are concentrated in large numbers to rest and feed prior to seasonal migrations. Because seabirds have the ability to leave the water, it is expected that increased noise levels would cause avoidance behavior that is likely to prevent birds from experiencing Permanent Threshold Shift (PTS) or Temporary Threshold Shift (TTS) from underwater construction noise associated with G&G and pile-driving activities, and any impacts would be short-term and minor.

Approaching vessel noise could temporarily disturb some individual diving birds, but they would be expected to acclimate to the noise or move away, potentially resulting in short-term displacement. Collectively, these noise sources would be short-term and localized and result in a minor impact to these birds.

Low-flying aircraft (i.e., rotary-winged [helicopters]/fixed-winged) generate noise from engines, airframe, and propellers. The dominant tones for these types of aircraft are generally below 500 Hz (BOEM 2022a) and within the airborne auditory range of birds. Rotary-winged/fixed-wing aircraft may cause birds in flight or on the sea surface to flush, resulting in increased energy expenditure. Disturbance to birds would be short-term and localized with impacts dissipating once the aircraft departs the area. Birds may return to relaxed behavior within 5 minutes of the overflight (Komenda-

Zehnder et al. 2003); however, birds can be disturbed up to 0.6 mi (1.0 km) away from an aircraft (Efroymson et al. 2000). No population-level effects to birds would be expected.

Accidental releases – contaminants: Accidental discharges and releases of oil, fuel, or other hazardous materials could directly and indirectly affect birds. Toxin ingestion has the potential to result in lethal and sublethal impacts on birds, including decreased hematological function, dehydration, drowning, hypothermia, starvation, and weight loss (Briggs et al. 1997; Haney et al. 2017; Paruk et al. 2016). Indirect effects of the oiling of feathers can lead to sublethal effects, such as changes in flight efficiencies, resulting in increased energy expenditure during daily and seasonal activities, including chick provisioning, commuting, courtship, foraging, long-distance migration, predator evasion, and territory defense (Maggini 2017). The likelihood of adverse population-level impacts on birds from accidental releases of hazardous materials from future activities on the OCS is considered by BOEM to be low. Current regulations and requirements imposed on federally approved activities prohibit vessels from dumping potentially harmful debris, require measures to avoid and minimize spills of toxic materials, and provide mechanisms for spill reporting and response. Based on these factors, accidental releases and discharges from federally approved activities on the OCS are not expected to appreciably contribute to adverse bird impacts, and, therefore, the effects of the No Action Alternative would be negligible to birds.

Accidental releases – trash and debris: Accidental disposal of trash and debris (plastics, paper, wood, glass, and/or metal) into water represents a risk factor to birds as they could potentially ingest or become entangled in debris. Ingestion of trash can negatively impact foraging and the ability to fly, which would ultimately reduce survival ability (Kühn et al. 2015). Ingestion and inhalation of macro- and microplastics can indirectly affect birds by causing obstruction of the gastrointestinal tract and resulting in mortality. In addition, it can interfere with flight and foraging as well as reduced fitness due to the plastics acting as a vector for other contaminants such as PCBs or plastic-derived additives (Teuten et al. 2009; Tanaka et al. 2013; Yamashita et al. 2011; Roman et al. 2019; Wang et al. 2021). Expected compliance with USCG vessel regulations would minimize exposure to trash or other debris. Therefore, accidental trash releases from offshore construction and maintenance vessels would be rare, and, therefore, the effects of the No Action Alternative would be negligible.

Traffic: Traffic associated with the construction of onshore transmission and interconnection cables, O&M, and decommissioning for future offshore wind activities could also affect shorebirds, some seabirds, and land birds that use the terrestrial habitats in the immediate vicinity of construction activities. Traffic-related impacts would have short-term, minor impacts on birds because construction would occur in already developed areas where birds are habituated to these types of activities. Therefore, the impacts associated with construction traffic would be comparable to existing sources of traffic in the local area.

In offshore areas, vessel, aircraft, and helicopter traffic could cause some birds, including loons, grebes, petrels, shearwaters, gannets, cormorants, sea ducks, terns, and skimmers to temporarily avoid the vicinity surrounding the WTGs and routes used by vessels and aircraft. Birds may collide with the vessels

at night if vessels flush birds resting on the water; however, construction traffic would be short-term and similar to normal, non-wind farm related traffic and is not likely to cause permanent displacement or a high risk of collision mortality.

Aircraft operating in association with future wind activities may pose a risk of collision with birds; however, general aviation traffic accounts for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2021). Because number of aircraft flights associated with offshore wind development are expected to be minimal in comparison to baseline conditions, aircraft strikes with birds are highly unlikely to occur. As such, aircraft traffic associated with future wind activities would not be expected to appreciably contribute to overall impacts on birds, and therefore would have negligible impact.

Lighting: Nighttime lighting associated with offshore structures and vessels could represent a source of attraction, particularly for nocturnally-migrating birds under certain low-visibility environmental conditions (reference – many standard ones). As a result of this attraction, birds and bird flocks have the potential to become disoriented, "entrapped" into circling the light to the point of exhaustion or collide with operating WTGs and associated structures and vessels (Rebke et al. 2019; USFWS 2022b). The WTGs and OCS-DC would have hazard and aviation obstruction lighting that would be incrementally added through 2030. Structure lighting may pose an increased collision or predation risk (Hüppop et al. 2006); however, this risk would be localized in extent and minimized by BOEM lighting guidelines (BOEM 2019; Kerlinger et al. 2010). Lighting for WTGs would consist of flashing red aircraft obstruction lighting, which has not been found to be a source of attraction for birds or their prey. Vessel lighting would result in short-term and minor impacts to birds while construction is occurring, while WTG lighting could result in negligible to minor long-term impacts.

Presence of structures: The presence of infrastructure can lead to beneficial and adverse impacts on certain birds. Beneficial effects to some locally foraging diving seabirds or seaducks can occur from the reef effect and the associated increase in certain prey resources. Potential adverse impacts include increased risk of entanglement from gear loss and damage, migration disturbances, and displacement by or collision with WTGs. Similar impacts may arise from other project-associated infrastructures, such as buoys, met towers, foundations, scour and cable protections, and transmission cable infrastructure.

The primary impacts to bird resources expected from the presence of structures would be displacement and collision of migrating birds and flocks with the rotating turbine blades from operating WTGs. Behavioral reactions can include avoidance, resulting in functional habitat or energy loss and attraction, causing an increased risk of collisions with WTGs within the planned WEAs (BOEM 2019; Peschko et al. 2020).

As discussed in BOEM (2012), at least 55 bird species could encounter operating WTGs on the Atlantic OCS. The abundance of bird species that overlap with the anticipated development of wind energy facilities on the Atlantic OCS, however, is relatively small as modeled 47 of those species by Winship et al. (2018). The relative seasonal exposure is expected to be very low, ranging from 0 to 5.2 percent (see Table 3.4.3-2 in BOEM 2021b).

With the proposed 1.15-by-1.15-mi (1.85-by-1.85-km) spacing between structures associated with future offshore wind development and the distribution of anticipated projects, only a small percentage of bird species migrating over the OCS are expected to encounter WTGs. The spacing between turbines would permit some birds to fly through individual lease areas without changing course or with only making minor course corrections to avoid operating WTGs (BOEM 2022a). The additional travel distance would be a maximum of 5 nm, which is a small distance in comparison to the distances traveled during most migrations. Loons, sea ducks, terns, and alcids are most likely to have high displacement ranks (COP, Appendix P1; Stantec 2022b); however, the relative density of birds in the OCS is low, and relatively few birds are likely to encounter wind turbines (BOEM 2021b). Displacement would be miniscule when compared with the overall daily distances traveled by migratory birds, and so is unlikely to cause displacement impacts to most individuals. The WEA is not within critical rest or feeding areas nor is it anticipated interfere with small proportion of birds' that fly through the area ability to reach these areas. Therefore, displacement impacts from future planned offshore wind activities would be long-term but minor, and no population-level effects would be expected.

In the contiguous United States, bird collisions with operating WTGs are believed to be relatively rare events, with one recent study estimating 140,000 to 328,000 (mean = 234,000) birds killed annually by 44,577 onshore turbines (Loss et al. 2013); although collision fatality rate calculations for large commercial-scale WTGs have been limited by confounding variables including knowledge of scavenger rates and the difficulty in observing collisions and collecting specimens over a large area. Data collection for offshore WTG facilities can also be affected by variable carcass sinking rates and other limits to observing and collecting specimens at sea. A collision vulnerability model constructed for SRWF found that no offshore bird species had a high collision vulnerability score; all shearwaters and petrels, most gulls, and terns had a medium collision vulnerability score (COP, Appendix P1; Stantec 2022b). Given that a very small proportion of birds of all species would transit the WEA each year, that most birds would fly below the RSZ during the day or above the RSZ at night (COP, Appendix P1; Stantec 2022b), and the relative low density of birds in the OCS, few birds are likely to encounter wind turbines in the planned WEAs (BOEM 2021b). Collision impacts from future planned offshore wind activities would long-term but minor, and no population-level effects would be expected during turbine operations.

The addition of WTGs to the offshore environment could result in increased functional loss of habitat for those bird species with higher displacement sensitivity; however, open water habitat is not a limiting factor for bird species in the area and substantial foraging habitat for birds would remain available given that future wind farms are only expected to occur in a relatively small portion of the OCS (COP, Appendix P1; Stantec 2022b). Therefore, impacts to birds from habitat loss due to displacement would be minor, and no population-level impacts would occur.

In the Northeast and Mid-Atlantic Bight, fisheries observers and monitors documented 655 bycatch events of seabirds in 2015 and 2016 through interaction with commercial fishing gear each year. Of those, 94 percent were with gillnets and involved shearwaters, gulls, cormorants, gannets, murres, fulmars, and loons (Sigourney et al. 2019). Localized increase in recreational fishery target species

associated with construction of structures may result in increased use of the areas immediately around the WTGs for recreational fishing. Therefore, the addition of new WTGs could potentially increase the entanglement risk associated with fishing gear for some species, leading to various bird injuries and mortalities. Impacts from fishing gear would generally be localized; however, the risk of occurrence would continue if structures remained in place. WTGs and foundations could increase pelagic productivity in local areas (English et al. 2017) with these new structures creating a reef effect habitat for structure-oriented and/or hard-bottom prey species. As observed by English et al. (2017) and Causon and Gill (2018), the reef effect habitat associated with WTGs has led to local increases in biomass and diversity within 1 or 2 years after construction, indicating that offshore wind farms can generate beneficial long-term impacts on local ecosystems, translating to increased foraging opportunities for some marine bird species. Therefore, the presence of structures may result in minor beneficial impacts for the duration of the future offshore wind projects (Degraer et al. 2020).

3.8.3.3 Impacts of Alternative A on ESA-Listed Species

Based on the information contained in this document, BOEM anticipates that the reasonably foreseeable offshore wind activities are likely to result in rare cases of mortality for ESA-listed birds. Therefore, the effects from future wind projects are likely to adversely affect but not jeopardize the continued existence of piping plovers, rufa red knots, and roseate terns.

3.8.3.4 Conclusions

Impacts of the No Action Alternative

The proposed Project would not be built under the No Action Alternative and hence would not itself have any adverse impacts on birds. BOEM expects ongoing activities, non-offshore wind and future offshore wind would have continuing short-term and long-term impacts to bird species, including federally listed species. Wind and non-wind activities would introduce land disturbance, seafloor disturbance/sediment suspension and deposition, noise, traffic, accidental releases, lighting, and the presence of structures to the GAA (Appendix D), as well as alter existing bird habitat. The IPFs associated with existing and ongoing projects are not expected to significantly alter bird populations. BOEM anticipates that impacts to birds due to ongoing activities associated with the No Action Alternative would include **minor** adverse impacts as well as the potential for **minor beneficial** impacts.

Cumulative Impacts of the No Action Alternative

Considering all the IPFs from future offshore projects, including future offshore wind development, BOEM anticipates that the overall cumulative impacts associated with offshore wind activities in the GAA under the No Action Alternative would result in long-term **moderate** adverse impacts to birds but could potentially include **minor beneficial** impacts because of the presence of structures. The majority of offshore structures in the GAA would be attributable to the offshore wind development. Migratory birds that use the offshore wind lease areas during all or parts of the year would either be exposed to new collision risk or experience long-term functional habitat loss due to behavioral avoidance and

displacement from wind lease areas on the OCS. The offshore wind development would also be responsible for the majority of impacts related to new cable emplacement and pile-driving noise, but effects on birds resulting from these IPFs would be localized and short-term and would not be expected to be biologically significant.

3.8.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario for the Proposed Action; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts to birds:

- The new OnCS-DC and the routing of the OTC
- The number of WTGs
- The size of the WTGs
- The time of year during which construction occurs

Variability of the proposed Project design exists as outlined in Appendix C. Below is a summary of potential variances in impacts:

- Changes to the OnCS-DC location and size and/or the routing location and length of the onshore transmission cable which could require the removal of trees and other natural habitat suitable for nesting, foraging, or roosting birds.
- The number of WTGs: a decrease in the number of WTGs would decrease the potential of collision mortality and displacement impacts to flying birds.
- Season of construction: the activity and distribution of birds exhibit distinct seasonal changes. For instance, summer and fall months (generally May through October) constitute the most active season for birds in the Project Area, and the months of April and November coincide with major migration events. Therefore, construction during months in which birds are not present, not breeding, or less active would have a lesser impact on birds than construction during more active times.

3.8.5 Impacts of Alternative B – Proposed Action on Birds

The activities associated with offshore SRWF (94 11-MW WTGs out of 102 potential positions) and SRWEC-OCS/SRWEC-NYS cabling, and OnCS-DC, transmission cable, and interconnection cable with Alternative B include construction and installation, O&M, and decommissioning. These actions have the potential to cause both direct and indirect impacts to birds. The IPFs associated with construction and post-construction O&M activities include land disturbance, seafloor disturbance/sediment suspension and deposition, noise, traffic, accidental releases, lighting, and the presence of structures. These IPFs are thoroughly discussed in the bird assessment prepared for this Project (COP, Appendix P1; Stantec 2022b). The conclusions of the bird assessment are presented in this section and include consideration of the Project's mitigation and monitoring measures (Appendix H).

3.8.5.1 Construction and Installation

3.8.5.1.1 Onshore Activities and Facilities

Land disturbance: No physical impacts to beach habitats for avian foraging, breeding, and loafing and roosting areas are expected because installation for the SRWEC-NYS would occur under the beach; however, noise and human activity from installation of the cofferdam, from the landfall ICW/HDD in the sea-to-shore transition, and at beach work staging areas could result in short-term, localized disturbance or displacement. The onshore SRWEC-NYS routes would be constructed within existing ROWs comprising predominantly developed land cover type (e.g., Homer et al. 2015) with limited bird use, thus minimizing possible disturbances to land birds. Construction of the OnCS-DC, OTC, and onshore interconnection cable is expected to result in removal of approximately 4.7 ac (0.019 km^2) of developed land and 2.3 ac (0.009 km^2) of permanent tree clearing resulting in negligible impacts to bird habitats. During the breeding season, clearing of trees or vegetation could result in destruction eggs and nestlings, thus adversely impacting some individuals; however, lasting impacts to local breeding populations are not anticipated since the eliminated habitat is small when compared to the available breeding habitat in the outside of the project footprint. Where possible, trees and vegetation would be cut during winter months (December through February) when most migratory birds are not present. Overall, land disturbance from construction and installation is expected to result in minor, short-term impacts to birds.

Seafloor disturbance/Sediment suspension and deposition: At the sea-to-shore transition, HDD would minimize potential construction impacts of seafloor disturbance and sediment suspension and disposition on the intertidal community of foreshore, backshore, dune, and interdunal area near the Fire Island landing site (Sunrise Wind 2023). No long-term changes in intertidal habitat community structure or prey availability (i.e., invertebrates, small crustaceans, bivalve mollusks, small polychaete worms, insects, and talitrid amphipods) are expected (see Section 3.10.5). Any increase in turbidity and sedimentation would be short-term, localized, and minor, resulting in no lasting physical changes to coastal areas or beaches and result in negligible impacts to birds.

Noise: Noise associated with construction of the onshore transmission cable and onshore interconnection cable could affect shorebirds, some seabirds, and land birds that use the terrestrial habitats in the immediate vicinity of construction activities. Noise-related impacts would have short-term, minor impacts on these birds because construction would occur in already developed areas where birds are habituated to these types of activities. Therefore, the impacts associated with construction noise would be like existing sources of noise in the local area.

Noise from installation of the casing pipe or sheet piles and from HDD in the sea-to-shore transition and activities at beach work areas could result in short-term, localized disturbance or displacement of listed threatened and endangered bird species. The piping plover and roseate tern could nest and/or forage in or near the area impacted during construction; both species have historically nested on Fire Island (NYSERDA 2017a; NPS 2018; Peters 2008). The migratory rufa red knot could forage near the landfall site

and onshore SRWEC routes. The potential for impacts to these species was considered during the Project siting process. To ensure avoidance of nesting habitat and to minimize the potential for impacts, the HDD work area was set back at least 650 ft (198 m) from the mean high water line so that the entrance point would be in interior land areas and the exit point would be offshore beyond the intertidal zone. Additionally, on-beach construction activities (i.e., between back dunes and mean low water) are not scheduled to occur during the roseate tern and piping plover breeding periods (i.e., April 1 through August 31), and rufa red knots are migratory and do not nest in the United States. Because construction work at the selected landing site would occur largely outside of the breeding period to the extent practical (per APMs) of listed species that might nest in the area and because use of the small area of shoreline by shorebirds at the landing sites would be minimal (Stantec 2018a), onshore impacts for listed species from noise and construction activity would be negligible to minor and short-term. Additionally, the Project would avoid work within a 1,000-m radius from active nests with unfledged piping plover chicks until clearance has been granted by NYSDPS and NYSDEC. During construction, the onsite 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 NYSDPS and NYSDEC.

Traffic: Traffic associated with construction of the onshore transmission cable and onshore interconnection cable could also affect shorebirds, some seabirds, and land birds that use the terrestrial habitats in the immediate vicinity of construction activities. Traffic-related impacts would have short-term, minor impacts on these birds because construction would occur in already developed areas where birds are habituated to these types of activities and would be comparable to existing sources of traffic in the local area Therefore, the impacts associated with construction traffic would be minor and short-term.

3.8.5.1.2 Offshore Activities and Facilities

Seafloor disturbance/Sediment suspension and deposition: Seafloor preparation for the construction of the WTG foundations, scour protection installations, and the subsea cable installations (SRWEC-OCS and SRWEC-NYS in federal and state waters) could result in short-term habitat disturbance through seafloor disturbance and sediment suspension and deposition. These construction activities may temporarily displace prey sources and/or reduce prey visibility for foraging birds (e.g., gannets, cormorants, sea ducks, terns, and gulls) (Fox and Petersen 2019); however, impacts would be negligible to minor given the localized nature of these impacts and the abundance of surrounding foraging habitat.

Noise: Construction noise and vessel traffic could increase underwater and airborne noise levels. Of all the underwater noise sources from the Proposed Action, pile driving and sonar operation associated with G&G surveys are the noise sources that have the most significant overlap with diving bird hearing (Figure 3.8-1. Overlap in Diving Bird Hearing Range with Various Sound Sources. Source: McGrew et al. 2022). Preliminary studies on bird behavior have indicated that seabirds may exhibit avoidance behaviors in response to underwater noises (Hansen et al. 2020). Underwater noise may force some diving bird species to flee from foraging or staging habitats adjacent to foundation piles causing short-

term stress and behavioral changes ranging from mild annoyance to escape behavior (BOEM 2014; BOEM 2016). Potential impacts could be greater if avoidance and displacement of birds occurred during their seasonal migration periods. Because seabirds could leave the water, it is expected that increased noise levels would cause avoidance behavior that is likely to prevent birds from experiencing PTS or TTS from underwater construction noise associated with G&G and pile-driving activities. Approaching vessel noise could disturb some individual diving birds which would eventually acclimate to the noise or move away, potentially resulting in short-term displacement. Collectively, these noise sources would be short-term and localized, resulting in a minor impact to these birds.

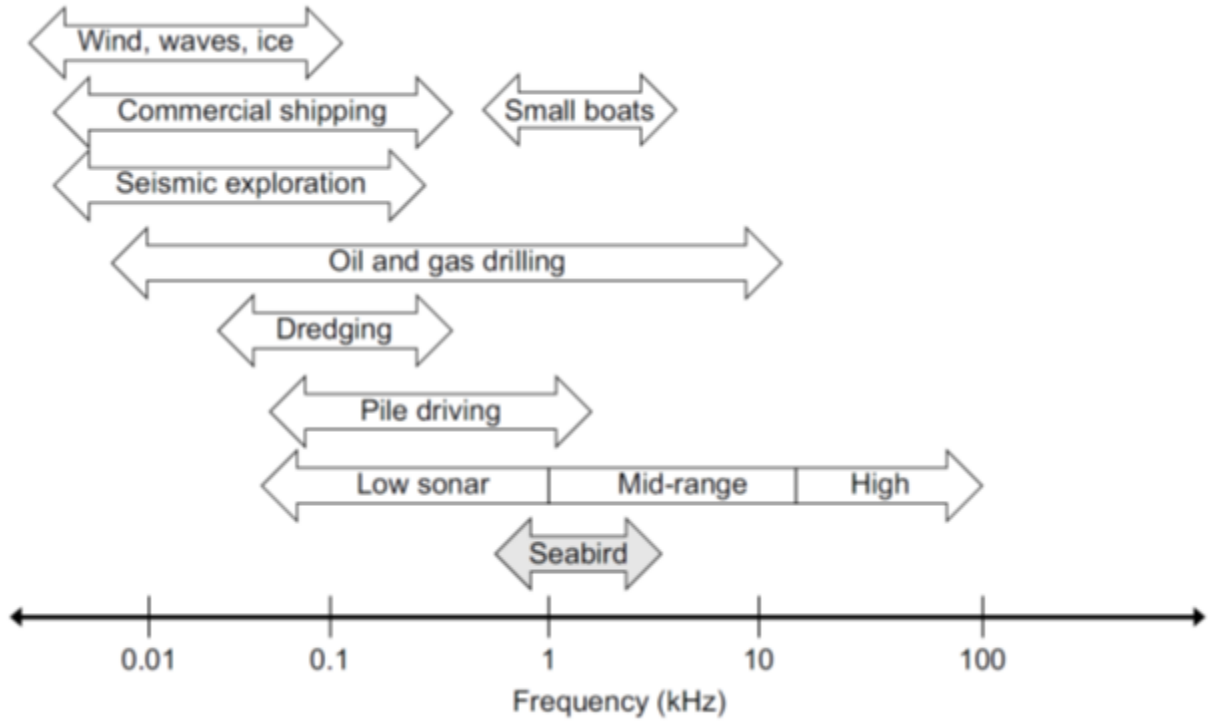

Figure 3.8-1. Overlap in Diving Bird Hearing Range with Various Sound Sources. Source: McGrew et al. 2022

Low-flying aircraft (i.e., rotary-winged [helicopters]/fixed-winged) generate noise from engines, airframe, and propellers. The dominant tones for these types of aircraft are generally below 500 Hz (BOEM 2022a) and are within the airborne auditory range of birds. Rotary-winged/fixed-wing aircraft noise may cause birds in flight or on the sea surface to flush, resulting in increased energy expenditure. Disturbance to birds would be short-term and localized with impacts dissipating once the aircraft has departed the area. Birds may return to relaxed behavior within 5 minutes of the overflight (Komenda-Zehnder et al. 2003); however, birds can be disturbed up to 0.6 mi (1.0 km) away from an aircraft (Efroymson et al. 2000). The potential for bird collision decreases for aircraft flying at speeds greater than 93 mph (41.6 mps) (Efroymson et al. 2000). Approaching aircraft noise could disturb some individual diving birds which would eventually acclimate to the noise or move away, potentially resulting

in short-term displacement. No individual or population-level effects to birds would be expected. These noise source disturbances would be short-term and localized, resulting in minor impact to these birds.

Accidental releases – contaminants, trash, and debris: Potential adverse impacts to birds from accidental contaminant discharges and releases (oil) or from improper disposal of trash and debris (macro/microplastics) during construction would be avoided or minimized with adherence to international (IMO MARPOL), federal (USCG, USEPA, BOEM), state, and local regulations regarding disposal of solid and liquid wastes (see Section 3.5.6 in the COP; Sunrise Wind 2023), resulting in negligible to minor short-term impacts to birds.

Traffic: For offshore areas, vessel, aircraft, and helicopter traffic could cause some species of birds, including loons, grebes, petrels, shearwaters, gannets, cormorants, sea ducks, terns, skimmers, and migrant passerines, to temporarily avoid the area. Other species may be attracted to vessel traffic (e.g., gulls are attracted to fishing vessels). In some very rare cases, birds may collide with the vessels at night if vessels flush birds resting on the water; however, construction traffic would be short-term and similar to normal, non-wind farm related traffic and is not likely to cause permanent displacement or a high risk of collision mortality.

Aircraft operating in association with future wind activities may pose a risk of collision with birds; however, general aviation traffic accounts for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2021). Because aircraft flights associated with offshore wind development are expected to be minimal in comparison to baseline conditions, aircraft strikes with birds are highly unlikely to occur. As such, aircraft traffic associated with offshore construction activities would not be expected to appreciably contribute to overall impacts on birds.

Vessel and aircraft traffic associated with construction and installation would result in minor, short-term impacts from behavioral disturbances from vessel and aircraft movement.

Lighting: Brightly illuminated offshore structures pose a risk to birds migrating at night (Rebke et al. 2019; USFWS 2022b). Birds can become disoriented by sources of artificial light (Zapata et al. 2019; Sunrise Wind 2023). Lighting used during construction would be short-term (two construction seasons) and limited to the minimum required for project safety to minimize potential impacts to wildlife. Construction vessels would use lighting technology that minimizes impacts on avian species to the extent practicable such as light shielding and downlights. WTGs would use radar-based Aircraft Detection Lighting System (ADLS) aircraft obstruction lighting.

The Proposed Action includes the use of red flashing aviation obstruction lights on WTGs and electric service platforms (ESPs) in accordance with FAA and BOEM requirements (Sunrise Wind 2023). The lights would consist of two L-864 medium-intensity red lights mounted on the nacelle and up to three L-810 low-intensity red lights mounted on the midsection of the WTG tower, and all lights would have a synchronous flash rate of 30 flashes per minute (Sunrise Wind 2023). ADLS may also be installed so that obstruction lights would only be activated when aircraft are near the turbines. The use of ADLS would

dramatically reduce the amount of time the obstruction lights are on. In the Sunrise Wind ADLS efficacy analysis (COP, Appendix Y2, Stantec 2022a), the total obstruction light system for historical air traffic data had an activated duration of 35 minutes and 14 seconds over a 1-year period for 636-ft WTGs. Total obstruction light system activated duration increases slightly to 1 hour 21 minutes and 29 seconds over a 1-year period for 968-ft WTGs. Since the Sunrise Wind WTGs would have a height of 787 ft above MSL, the activated duration of ADLS-controlled obstruction lights could fall around the middle of this range.

Navigation lights would also be placed on all turbines and the OCS-DC. Per the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) guidance document referenced in the COP (Sunrise Wind 2023), navigation lighting would have the following characteristics: corner structures with flashing yellow lights with a visible range of 5 NM (moderate intensity) and a special mark characteristic (special flash pattern) and external border towers with flashing yellow lights with a nominal range of 2 NM (low intensity) (IALA 2013). Significant peripheral structures would be up to 3 NM apart, and the border/periphery lighted structures would be up to 2 NM apart. All other towers could have low-intensity flashing yellow lights visible for 2 NM. Flashing yellow lights of low to moderate intensity are not expected to have any increased mortality in comparison to unlit towers.

The use of ADLS could result in a 99-percent reduction in operational time for WTG warning lights, and flashing red lights minimizes attraction of birds to WTGs in overcast conditions (Rebke et al. 2019). Based on these factors, impacts to birds from lighting associated with construction would be negligible to minor.

Construction vessels are also a source of artificial lighting, which could attract birds and cause disorientation and collision or predation risk. However, the potential impact would be short term, lasting only the duration of construction and, as previously described, the abundance of bird species on the OCS that overlap with the anticipated wind development of wind energy facilities is relatively small. Therefore, BOEM anticipates vessel lighting would result in short-term and minor impacts on birds.

3.8.5.2 Operations and Maintenance

3.8.5.2.1 Onshore Activities and Facilities

Land disturbance: The OnCS-DC is sited in an already developed area with minimal tree cover. Infrequent land disturbance during O&M is expected to be comparable to general commercial and industrial activities already occurring in the area. The APMs outlined in Appendix H (*Mitigation and Monitoring*) of this Final EIS would be used to minimize impacts. Therefore, potential impacts associated with O&M are considered short-term and minor.

Noise: Infrequent sources of noise during O&M are expected to be comparable to general commercial and industrial activities already occurring in the area. Impacts to avian species anticipated during O&M of the OnCS-DC would be the introduction of new sounds associated with the synchronous condenser

building. Anthropogenic sources of noise can have negative impacts on fitness and breeding success of land birds (Kleist et al. 2018). The APMs outlined in the EIS Appendix H would be used to minimize noise impacts. Therefore, potential impacts associated with O&M are considered short-term and minor.

Accidental releases – contaminants, trash, and debris: Short-term, routine, and non-routine maintenance activities of the OnCS-DC and onshore transmission cable and onshore interconnection cable may result in accidental discharges and releases; however, any long-term risks would be minor and mitigated through implementation of the spill prevention and control measures and associated BMPs.

Traffic: Infrequent routine and non-routine maintenance traffic during O&M are expected to be comparable to general commercial and industrial activities already occurring in the area. The APMs outlined in the EIS Appendix H would be used to minimize impacts. Therefore, potential impacts associated with O&M are considered short-term and minor.

Lighting: Infrequent nighttime lighting during O&M are expected to be comparable to general commercial and industrial activities already occurring in the area (e.g., commercial shipping and fishing vessels, operating wind farms). The APMs outlined in the EIS Appendix H would be used to minimize impacts. Therefore, potential impacts associated with O&M are considered short-term and minor.

3.8.5.2.2 Offshore Activities and Facilities

Seafloor disturbance/Sediment suspension and deposition: Seafloor disturbance and sediment suspension and deposition during O&M would primarily result from vessel anchoring, jack-up, and any maintenance activities that would require exposing and reburying the IAC. These activities are expected to be non-routine events; they are not expected to occur with any regularity. It is likely that pelagic and mobile benthic prey species present near the SRWF during any maintenance activities would temporarily avoid the area in which activities are occurring, and zooplankton species may face localized, short-term displacement. However, any alterations to marine bird prey distributions are expected to occur over a small scale and a short period. Therefore, the potential impacts to birds from seafloor disturbance/sediment suspension and deposition during O&M would be negligible.

Noise: Low-flying aircraft (i.e., rotary-winged [helicopters]/fixed-winged) generate noise from engines, airframe, and propellers. The dominant tones for these types of aircraft are generally below 500 Hz (BOEM 2022a) and within the airborne auditory range of birds. During the O&M phase of the Proposed Action, rotary-winged/fixed-wing aircraft may cause birds in flight or on the sea surface to flush, resulting in increased energy expenditure. Disturbance to birds would be short-term and localized with impacts dissipating once the aircraft departs. Birds may return to relaxed behavior within 5 minutes of the overflight (Komenda-Zehnder et al. 2003); however, birds can be disturbed up to 0.6 mi (1.0 km) from an aircraft (Efroymson et al. 2000). The potential for bird collision decreases for aircraft flying at speeds greater than 93 mph (41.6 mps) (Efroymson et al. 2000). Aircraft noise could disturb some individual diving birds which would eventually acclimate to the noise or move away, potentially resulting

in short-term displacement. These noise source disturbances would be short-term and localized, with no population-level effects expected, resulting in minor impact to these birds.

Accidental releases – contaminants, trash, and debris: Accidental discharges and releases of contaminants (oil) and trash and debris (macro/microplastics) are expected to generally be like other offshore construction and installation resulting in negligible to minor short-term impacts with implementation of APMs outlined in Appendix H of this Final EIS.

Traffic: Vessel and aircraft used during O&M are expected to generally be similar to those used during offshore construction and installation, with similar levels of vessel traffic per year, resulting in negligible implementation of APMs outlined in EIS Appendix H.

Lighting: The WTGs and OCS-DC are required by the FAA to have aviation hazard navigation lights for the duration of the Project. Red flashing aviation obstruction lights are commonly used for this purpose at land-based wind facilities without observed increase in avian mortality compared with unlit turbine towers (Kerlinger et al. 2010). Construction vessels would use lighting technology that minimizes impacts on avian species to the extent practicable such as light shielding and downlights. WTGs would use radar-based ADLS aircraft obstruction lighting.

The Proposed Action includes the use of red flashing aviation obstruction lights on WTGs and ESPs in accordance with FAA and BOEM requirements (Sunrise Wind 2023). The lights would consist of two L-864 medium-intensity red lights mounted on the nacelle and up to three L-810 low-intensity red lights mounted on the midsection of the WTG tower, and all lights would have a synchronous flash rate of 30 flashes per minute (Sunrise Wind 2023). ADLS may also be installed so that obstruction lights would only be activated when aircraft are near the turbines. The use of ADLS would dramatically reduce the amount of time the obstruction lights are on. In the Sunrise Wind ADLS efficacy analysis (COP, Appendix Y2, Stantec 2022a), the total obstruction light system for historical air traffic data had an activated duration of 35 minutes and 14 seconds over a 1-year period for 636-ft WTGs. Total obstruction light system activated duration increases slightly to 1 hour 21 minutes and 29 seconds over a 1-year period for 968-ft WTGs. Since the Sunrise Wind WTGs would have a height of 787 ft above MSL, the activated duration of ADLS-controlled obstruction lights could fall around the middle of this range.

Navigation lights would also be placed on all turbines and the OCS-DC. Per the IALA guidance document referenced in the COP (Sunrise Wind 2023), navigation lighting would have the following characteristics: corner structures with flashing yellow lights with a visible range of 5 NM (moderate intensity) and a special mark characteristic (special flash pattern) and external border towers with flashing yellow lights with a nominal range of 2 NM (low intensity) (IALA 2013). Significant peripheral structures would be up to 3 NM apart, and the border/periphery lighted structures would be up to 2 NM apart. All other towers could have low-intensity flashing yellow lights visible for 2 NM. Flashing yellow lights of low to moderate intensity are not expected to have any increased mortality in comparison to unlit towers.

The use of ADLS could result in a 99-percent reduction in operational time for WTG warning lights, and flashing lights minimize attraction of birds to WTGs in overcast conditions (Rebke et al. 2019). The impact of the Proposed Action alone would not noticeably increase the impacts of light beyond described under the No Action Alternative. In the context of existing conditions and reasonably foreseeable future activities, lighting from the Proposed Action during O&M is expected to have only non-measurable negligible adverse impacts, if any, to individuals or populations.

Construction vessels are also a source of artificial lighting, which could attract birds and cause disorientation and collision or predation risk. However, the potential impact would be short term, lasting only the duration of construction and, as previously described, the abundance of bird species on the OCS that overlap with the anticipated wind development of wind energy facilities is relatively small. Therefore, BOEM anticipates vessel lighting would result in short-term and minor impacts on birds.

Presence of structures: During the O&M period, the primary impact expected for various avian species would be colliding with, or avoiding, turbine blades within the RSZ at the SRWF during migration. Marine birds with relatively greater exposure to the SRWF (i.e., greater than land birds and coastal birds) were included in the SRWF vulnerability model (COP, Appendix P1; Stantec 2022b). Species with high population vulnerability scores (more vulnerability) include one species of sea duck, three species of tern, two species of gull, and two alcid species; however, the density of bird species with high collision sensitivity is low within the offshore portion of the Project Area during all seasons (see Figure 13 in COP, Appendix P1; Stantec 2022b), and risk of collision would be reduced with implementation of APMs outlined in Appendix H (*Mitigation and Monitoring*). The Marine-life Data and Analysis Team density maps for all 38 species within the Lease Area are available in the COP (COP Appendix P1; Stantec 2022b). Table 2-14 in Appendix P1 from the Sunrise Wind COP (Stantec 2022b) presents the final vulnerability scores for those species groups as well as seasons of risk. Federally and state-listed bird species may be at risk of collision during offshore construction/installation although risk of collision is considered low because these species are expected to infrequently occur over the SRWF (Stantec 2018b).

BOEM (2022b) considered the impacts to ESA-listed bird species. Telemetry data indicate that roseate terns, piping plovers, and rufa red knots may cross the SRWF during operation based on the Bay State Wind (2019) and MassCEC surveys (Veit et al. 2016), as well as BOEM and USFWS telemetry tracking data (Loring et al. 2018; Loring et al. 2019). Modeling of strike risk was conducted using the BAND Model (Band 2012) and the SCRAM (Gilbert et al. 2022) models. Model results are summarized in BOEM's biological assessment, BOEM's addendum to the BA, and USFWS Biological Opinion.

Species within the groups of loons and grebes, sea ducks, terns, and alcids had high displacement vulnerability scores (COP, Table 2.14; Sunrise Wind 2023). Displacement impacts are low for most other seabirds. Overall avian impacts would be minor because of the overall small area affected and the low number of birds affected within the entire OCS. Generally, the relative abundance of bird species that are most sensitive to displacement is low within the offshore portion of the Project Area, including several miles/kilometers outside the wind farm area during all seasons (see Figure 1-3 in COP, Appendix P1; Stantec 2022b).

Because SRWF WTGs would be spaced 1 nm apart, ample space between WTGs should allow birds that are not flying above WTGs to fly through individual lease areas without changing course or to make minor course corrections to avoid operating WTGs. The effects of offshore wind farms on bird movement ultimately depend on the bird species, size of the offshore wind farm, spacing of the turbines, and extent of extra energy cost incurred by the displacement of flying birds (relative to normal flight costs pre-construction) and their ability to compensate for this degree of added energy expenditure. Little quantitative information is available on how offshore wind farms may act as a barrier to movement, but Madsen et al. (2012) modeled bird movement through offshore wind farms using bird (common eider) movement data collected at the Nysted offshore wind farm in the western Baltic Sea just south of Denmark. After running several hundred thousand simulations for different layouts/configurations for a 100-WTG offshore wind farm, Madsen et al. (2012) determined that the proportion of birds traveling between turbines increased as distance between turbines increased. With 8 WTG columns at 200-meter (0.1-nm) spacing, no birds passed between the turbines. However, increasing inter-turbine distance to 500 m (0.27 nm) increased the percentage of birds to more than 20 percent, while a spacing of 1,000 m (0.54 nm) increased this further to 99 percent. The 0.6- to 1-nm spacing estimated for most structures that would be proposed on the Atlantic OCS is greater than the distance at which 99 percent of the birds passed through in the model. As such, adverse impacts of additional energy expenditure due to minor course corrections or complete avoidance of offshore wind lease areas would not be expected to be biologically significant. BOEM anticipates that any additional flight distances would likely be relatively small for most migrating birds when compared with the overall migratory distances traveled, and no individual fitness or population-level effects would be expected to occur.

In the Northeast and Mid-Atlantic Bight, fisheries observers and monitors have documented several hundred seabird bycatch events through interaction with commercial fishing gear in previous years, mainly with gillnets (Sigourney et al. 2019). Localized increase in recreational fishery target species associated with of the presence structures may result in increased use of the areas immediately around the WTGs for recreational fishing. Therefore, the addition of new WTGs could potentially increase the entanglement risk associated with recreational fishing gear, leading to various bird injuries and mortalities. Impacts from fishing gear would generally be localized; however, the risk of occurrence would continue as long as structures remain in place.

WTGs and foundations could increase pelagic productivity in local areas (English et al. 2017) with these new structures creating a reef effect habitat for structure-oriented and/or hard-bottom prey species. As observed by English et al. (2017) and Causon and Gill (2018), the reef effect habitat associated with WTGs has led to local increases in biomass and diversity within 1 or 2 years after construction, indicating that offshore wind farms can generate increased foraging opportunities for some marine bird species. Therefore, the presence of proposed Project structures may result in minor beneficial impacts as long as they are present (Degraer et al. 2020).

Long-term adverse impacts would be negligible to minor, depending on whether birds are at high risk for displacement, can access preferred habitat, or are at risk of entanglement. The reef effect associated with the WTG foundation and rock armoring would result in minor long-term beneficial impacts for some species.

3.8.5.3 Conceptual Decommissioning

Decommissioning would employ many of the same procedures and equipment used during construction. Hence, as in the construction phase, avoidance through scheduling and minimization by operational and abatement controls would also generally apply here.

The types of impacts to birds from conceptual decommissioning of the offshore SRWF and SRWEC-OCS would be similar to those described for the construction/installation phase. However, we anticipate that the overall level of impacts would be lower because pile-driving activities would not occur, and some structures and materials may be left in place such as scour protection and cable armoring.

3.8.5.3.1 Onshore Activities and Facilities

Noise: Noise would be a primary IPF during onshore decommissioning activities. Noise impacts to birds would be the same as or less than those described for onshore construction activities since the intensity and duration of potential impacts would likely be reduced from those discussed in the construction section because some materials and structures, including scour armoring and cables, may be left in place during decommissioning. Impacts to birds would be minor and short-term during decommissioning.

Traffic: Traffic would be a primary IPF during this activity. Traffic impacts to birds would be the same as or less than those described for construction activities because the intensity and duration of potential impacts would likely be reduced from those discussed in the construction section because some materials and structures, including scour armoring and cables, may be left in place. Impacts to birds would be minor and short-term during decommissioning.

Onshore impacts from land disturbance, seafloor disturbance, and suspended sediments to birds would be the similar to or of lower impact as those previously discussed for the onshore construction and installation.

3.8.5.3.2 Offshore Activities and Facilities

Noise: Noise would be the primary IPF associated with offshore decommissioning activities. If vessels are present for an extended period, they may provide beneficial roosting and foraging opportunities for birds from light-attracted insects. Underwater noise and disturbance levels generated during conceptual decommissioning would be similar to those described above for construction with the exception that pile driving would not be required. The monopiles would be cut below the bed surface for removal using a cable saw or abrasive waterjet. Noise levels produced by this type of cutting equipment are generally indistinguishable from engine noise generated by the associated construction vessel (Pangerc et al.

2016). Therefore, this decommissioning equipment would have significantly lower potential for noise effects compared to those already considered for construction vessel noise. Noise impacts to birds would be same or less than those described for construction activities. Impacts for all remaining IPFs to birds would be similar to those discussed for construction. Impacts to birds would be short-term and minor during decommissioning.

Traffic: Types of vessels used and overall vessel traffic during conceptual decommissioning is expected to be comparable to those associated with construction and installation. The APMs outlined in the EIS Appendix H would be used to minimize impacts. Therefore, potential impacts associated with conceptual decommissioning is considered short-term and minor.

3.8.5.4 Cumulative Impacts of the Proposed Action

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on birds through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Other future non-Project activities other than offshore wind development activities that may affect birds include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (Refer to Appendix E for a description of ongoing and planned activities). These activities could result in short-term or permanent displacement and injury to or mortality of individual birds, but population-level effects would not be expected for most species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, the Proposed Action would contribute an incremental increase in effects from the primary IPFs for birds.

3.8.5.5 Impacts of Alternative B on ESA-Listed Species

Based on the information contained in this document, we anticipate that the Proposed Action is likely to result in rare cases of mortality for ESA-listed birds. Therefore, the effects from the Proposed Action would likely to have negligible to minor adverse impacts to piping plovers, rufa red knots, and roseate terns.

3.8.5.6 Conclusions

Impacts of the Proposed Project

Project construction and installation, O&M, and conceptual decommissioning would cause impacts from the following IPFs: land disturbance, seafloor disturbance/sediment suspension and deposition, noise, traffic, lighting, accidental releases (contaminants, trash, and debris), and the presence of structures. Compared to construction and installation activities, impacts from proposed O&M activities would be similar but would occur at a lesser extent but for the life of the WTGs. BOEM anticipates adverse impacts resulting from the Proposed Action alone would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. Overall, impacts to individual birds and/or their habitat would be detectable and measurable but would not lead to long-term or population-level effects.

Cumulative Impacts of the Proposed Project

In the context of existing conditions other reasonably foreseeable planned actions, the incremental impacts from the Proposed Action resulting from individual IPFs would be moderate depending on the species depending on habitat or seasonal uses that vary by species. Considering all the IPFs, BOEM anticipates that the overall avian cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and offshore wind activities would result in **moderate** adverse impacts to birds because those impacts that are detectable and measurable would not lead to long-term or population-level effects. Potential **minor beneficial** impacts may result from the presence of structures.

3.8.6 Alternative C-1 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

Under Alternative C-1, the same number of WTGs (up to 94 WTGs) under the Proposed Action may be approved by BOEM; however, 8 WTG positions from Priority Area 1 along the northern boundary of the Lease Area would be excluded from consideration (Figure 2.1.3-1). The WTG sites to be removed from Priority Area 1 were selected to maximize the largest contiguous complex habitat area feasible and/or to reduce the number of 11-MW WTGs located near presumed Atlantic cod spawning location(s). This alternative would not significantly alter the construction methods, O&M, or conceptual decommissioning. Alternative C-1 would not increase the impact level or likelihood of impacts for birds; therefore, Alternative C would be expected to have negligible to minor impacts on birds from construction and installation, O&M, and conceptual decommissioning activities.

3.8.6.1 Construction and Installation

3.8.6.1.1 Onshore Activities and Facilities

No aspect of Alternative C-1 would alter the construction of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds

due to the construction of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.6.1.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-1 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.6.2 Operations and Maintenance

3.8.6.2.1 Onshore Activities and Facilities

No aspect of Alternative C-1 would alter the O&M of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the O&M of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.6.2.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-1 would significantly alter the O&M methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the O&M of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.6.3 Conceptual Decommissioning

3.8.6.3.1 Onshore Activities and Facilities

No aspect of Alternative C-1 would alter the conceptual decommissioning of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to conceptual decommissioning of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.6.3.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-1 would significantly alter the conceptual decommissioning methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the conceptual decommissioning of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.6.4 Cumulative Impacts of Alternative C-1

The cumulative impact analysis for Alternative C-1 considers the impacts of this alternative in combination with other planned non-offshore wind activities and planned offshore wind activities.

Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on birds through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Other future non-Project activities other than offshore wind development activities that may affect birds include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (Refer to Appendix E for a description of ongoing and planned activities). These activities could result in short-term or permanent displacement and injury to or mortality of individual birds, but population-level effects would not be expected for most species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, Alternative C-1 would contribute an incremental increase in effects from the primary IPFs for birds.

3.8.6.5 Impacts of Alternative C-1 on ESA-Listed Species

Based on the information contained in this document, we anticipate that Alternative C-1 for the SRWF Project is likely to adversely affect but not jeopardize the continued existence of piping plovers, rufa red knots, or roseate terns.

3.8.6.6 Conclusions

Impacts of Alternative C-1

Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for birds. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-1 are the same as described under the Proposed Action (Alternative B). BOEM anticipates adverse impacts resulting from Alternative C-1 would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. Overall, impacts to individual birds and/or their habitat would be detectable and measurable but would not lead to long-term or population-level effects.

Cumulative Impacts of Alternative C-1

Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for birds. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-1 are the same as described under the cumulative impacts of the Proposed Action (Alternative B). BOEM anticipates

that the overall avian cumulative impacts associated with Alternative C-1 when combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and offshore wind activities would result in **moderate** adverse and potential **minor beneficial** impacts to birds.

3.8.7 Alternative C-2 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

The primary effect of Alternative C-2 is the relocation of WTGs from priority areas to the eastern portion of the Lease Area. This proposed change would not significantly alter the construction methods, O&M, or conceptual decommissioning and would not result in additional impacts to birds other than those described under the Proposed Action (Alternative B).

3.8.7.1 Construction and Installation

3.8.7.1.1 Onshore Activities and Facilities

No aspect of Alternative C-2 would alter the construction of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the construction of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.7.1.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-2 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.7.2 Operations and Maintenance

3.8.7.2.1 Onshore Activities and Facilities

No aspect of Alternative C-2 would alter the O&M of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the O&M of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.7.2.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-2 would significantly alter the O&M methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the O&M of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.7.3 Conceptual Decommissioning

3.8.7.3.1 Onshore Activities and Facilities

No aspect of Alternative C-2 would alter the conceptual decommissioning of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to conceptual decommissioning of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.7.3.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-2 would significantly alter the conceptual decommissioning methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the conceptual decommissioning of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.7.4 Cumulative Impacts of Alternative C-2

The cumulative impact analysis for Alternative C-2 considers the impacts of this alternative in combination with other planned non-offshore wind activities and planned offshore wind activities.

Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on birds through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Other future non-Project activities other than offshore wind development activities that may affect birds include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (Refer to Appendix E for a description of ongoing and planned activities). These activities could result in short-term or permanent displacement and injury to or mortality of individual birds, but population-level effects would not be expected for most species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, Alternative C-2 would contribute an incremental increase in effects from the primary IPFs for birds.

3.8.7.5 Impacts of Alternative C-2 on ESA-Listed Species

Based on the information contained in this document, it is anticipated that Alternative C-2 for the SRWF Project is likely to adversely affect but not jeopardize the continued existence piping plovers, rufa red knots, or roseate terns.

3.8.7.6 Conclusions

Impacts of Alternative C-2

Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for birds. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-2 are the same as described under the Proposed Action (Alternative B). BOEM anticipates adverse impacts resulting from Alternative C-2 would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. Overall, impacts to individual birds and/or their habitat would be detectable and measurable but would not lead to long-term or population-level effects.

Cumulative Impacts of Alternative C-2

Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for birds. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-2 are the same as described under the cumulative impacts of the Proposed Action (Alternative B). BOEM anticipates that the overall cumulative avian impacts associated with Alternative C-2 when combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and offshore wind activities would result in **moderate** adverse and potential **minor beneficial** impacts to birds.

3.8.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.8.8.1 Construction and Installation

3.8.8.1.1 Onshore Activities and Facilities

No aspect of Alternative C-3 would alter the construction of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the construction of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.8.1.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-3 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.8.2 Operations and Maintenance

3.8.8.2.1 Onshore Activities and Facilities

No aspect of Alternative C-3 would alter the O&M of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the O&M of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.8.2.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-3 would significantly alter the O&M methods for offshore activities and facilities compared to the Proposed Action (Alternative B). The primary effect of these changes would be a potential reduction in the number of installed WTGs, with a concurrent reduction in the number of individuals exposed to potential impacts during construction, proportional reduction in the number of bird strikes associated with operating WTGs, and a reduction in the areal extent of long-term impacts to aquatic habitat. However, these changes would not be significant enough to change the impact level determinations for any of the impact level determinations for any of the IPFs. Therefore, there would be no direct or indirect impacts to birds due to the O&M of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.8.3 Conceptual Decommissioning

3.8.8.3.1 Onshore Activities and Facilities

No aspect of Alternative C-3 would alter the conceptual decommissioning of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to conceptual decommissioning of the onshore activities or facilities other than what is described under the Proposed Action.

3.8.8.3.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-3 would significantly alter the conceptual decommissioning methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to birds due to the conceptual decommissioning of the offshore activities or facilities other than what is described under the Proposed Action.

3.8.8.4 Cumulative Impacts of Alternative C-3

The cumulative impact analysis for Alternative C-3 considers the impacts of this alternative in combination with other planned non-offshore wind activities and planned offshore wind activities.

Ongoing and planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on birds through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. Other future non-Project activities other than offshore wind development activities that may affect birds include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (Refer to Appendix E for a description of ongoing and planned activities). These activities could result in short-term or permanent displacement and injury to or mortality of individual birds, but population-level effects would not be expected for most species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, Alternative C-3 would contribute an incremental increase in effects from the primary IPFs for birds.

3.8.8.5 Impacts of Alternative C-3 on ESA-Listed Species

Based on the information contained in this document, it is anticipated that Alternative C-3 for the SRWF Project is likely to adversely affect but not jeopardize the continued existence piping plovers, rufa red knots, or roseate terns.

3.8.8.6 Conclusions

Impacts of Alternative C-3

Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for birds. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-3 are the same as described under the Proposed Action (Alternative B). BOEM anticipates adverse impacts resulting from Alternative C-3 would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. Overall, impacts to individual birds and/or their habitat would be detectable and measurable but would not lead to long-term or population-level effects.

Cumulative Impacts of Alternative C-3

Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for birds. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-3 are the same as described under the cumulative impacts of the Proposed Action (Alternative B). BOEM anticipates

that the overall cumulative avian impacts associated with Alternative C-3 when combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and offshore wind activities would result in **moderate** adverse and potential **minor beneficial** impacts to birds.

3.8.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall negligible to minor adverse impacts and minor beneficial impacts on birds. Table 3.8-2 provides an overall summary of alternative impacts.

Table 3.8-2. Comparison of Alternative Impacts on Birds

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: The IPFs associated with existing and ongoing projects are not expected to significantly alter bird populations. BOEM anticipates that impacts to birds due to ongoing activities associated with the No Action Alternative would include **minor** adverse impacts as well as the potential for **minor beneficial** impacts. *Cumulative Impacts of the No Action Alternative*: BOEM anticipates that the overall cumulative impacts associated with offshore wind activities in the GAA under the No Action Alternative would result in long-term **moderate** adverse impacts but could potentially include **minor beneficial** impacts because of	*Proposed Action:* BOEM anticipates adverse impacts resulting from the Proposed Action alone would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. Overall, impacts to individual birds and/or their habitat would be detectable and measurable but would not lead to long-term or population-level effects. *Cumulative Impacts of the Proposed Action:* In the context of existing conditions other reasonably foreseeable planned actions, the incremental impacts from the Proposed Action resulting from	*Alternative C-1:* The conclusions for impacts of Alternative C-1 are the same as described under the Proposed Action. BOEM anticipates adverse impacts resulting from Alternative C-1 would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. *Cumulative Impacts of Alternative C-1*: The conclusions for cumulative impacts of Alternative C-1 are the same as described under the Proposed Action. Combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and	*Alternative C-2:* The conclusions for impacts of Alternative C-2 are the same as described under the Proposed Action. BOEM anticipates adverse impacts resulting from Alternative C-2 would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. *Cumulative Impacts of Alternative C-2:* The conclusions for cumulative impacts of Alternative C-2 are the same as described under the Proposed Action. Combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and	*Alternative C-3:* The conclusions for impacts of Alternative C-3 are the same as described under the Proposed Action. BOEM anticipates adverse impacts resulting from Alternative C-3 would be **minor** with additional **minor beneficial** impacts to some species (diving seabirds) from the presence of structures and underwater armoring. *Cumulative Impacts of Alternative C-3:* The conclusions for cumulative impacts of Alternative C-3 are the same as described under the cumulative impacts of the Proposed Action. Combined with past, present, and reasonably foreseeable environmental trends and planned non-

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
the presence of structures.	individual IPFs would be **moderate** depending on the species depending on habitat or seasonal uses that vary by species. When combined with past, present, and reasonably foreseeable environmental trends and planned non-offshore wind and offshore wind activities would result in **moderate** adverse cumulative impacts to birds because those impacts that are detectable and measurable would not lead to long-term or population-level effects. Potential **minor beneficial** impacts may result from the presence of structures.	offshore wind activities, the Alternative C-1 would result in **moderate** adverse and potential **minor beneficial** cumulative impacts to birds.	offshore wind activities, the Alternative C-2 would result in **moderate** adverse and potential **minor beneficial** cumulative impacts to birds.	offshore wind and offshore wind activities, the Alternative C-3 would result in **moderate** adverse and potential **minor beneficial** cumulative impacts to birds.

3.8.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Although Alternative C-3b would reduce the number of WTGs and their associated IACs, which would have an associated reduction in potential collision risk, the reduction in effects from impacts would not result in different impact level determinations. These adverse impacts would be avoided and minimized using the same APMs as described in the Proposed Action (see Table 3.8-3 below). BOEM expects that the impacts to birds resulting from the alternative alone would be similar to the Proposed Action and be minor adverse.

Therefore, BOEM expects the overall impact on birds from the Proposed Action alone to be long-term minor adverse; however, the resource would recover completely after decommissioning without remedial or mitigating action.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that Alternative C-3b impacts would be similar to the Proposed Action (with individual IPFs leading to impacts ranging from negligible to minor adverse and minor beneficial). The overall impacts of Alternative C-3b when combined with past, present, and reasonably foreseeable activities would therefore be the same level as under the Proposed Action: **moderate** adverse and potentially **minor beneficial**.

3.8.11 Proposed Mitigation Measures

The mitigation measures listed in Table 3.8-3 are recommended for inclusion in the Preferred Alternative.

Table 3.8-3. Proposed Mitigation Measures: Birds

Measure	Description	Effect
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 would be addressed through monitoring; and describes methods and time frames for data collection, analysis, and reporting. Sunrise Wind would engage with federal and state agencies and eNGOs to identify appropriate monitoring options and technologies, and to facilitate acceptance of the final plan.	If the reported post-construction bird monitoring results indicate bird impacts deviate substantially from the impact analysis included in this EIS, then Sunrise Wind must make recommendations for new mitigation measures or monitoring methods.
Bird deterrents	Install bird deterrent devices to minimize bird attraction to operating turbines and on the OSS, where appropriate and where Sunrise Wind determines such devices can be safely deployed.	Potential collision impacts with offshore WTGs and OSS could be reduced by requiring installation of bird deterrent devices to minimize bird attraction to operating WTGs and on the OSS.

3.8.11.1 Effect of Measures Incorporated into the Preferred Alternative

The mitigation measures listed in Table 3.8-3 are recommended for inclusion in the Preferred Alternative. These measures include adaptive mitigation and deterrent devices. These measures, if adopted, would have the effect of further reducing the overall impact from the Preferred Alternative.

3.9 Coastal Habitat and Fauna

This section describes the coastal habitats and fauna of the affected environment and potential impacts to these resources with respect to the Proposed Action, alternatives, and ongoing and planned activities in the GAA in which effects would be evident or expected.

Coastal habitats in the Project Area include those located within state waters (which extend 3 nm [5.6 km] from the shoreline) and inland to the mainland, inclusive of bays, back-barrier lagoons, and/or marshes (USFWS 1997) that separate the barrier islands from the coastal mainland on the Long Island south shore. Onshore Project activities would occur in Smith Point County Park on Fire Island before crossing William Floyd Parkway and then the ICW via HDD to Smith Point Marina on the mainland. Smith Point County Park includes 825 ac at the eastern end of Fire Island, within the boundaries of the 19,580-ac, 26-mile long, Fire Island National Seashore, although it is not managed by NPS. Smith Point County Park is also east of and adjacent to the Otis Pike Fire Island High Dune Wilderness, which is the only federally designated wilderness in the State of New York.

Coastal habitats of the barrier islands and south shore include the foreshore, backshore, dunes, and interdunal areas. Habitats along the mainland transmission corridor range from salt marshes to freshwater marshes and from maritime forests to upland and wetland forests. These coastal habitats are important to numerous species of fauna, including mammals, birds, herpetofauna, and invertebrates that depend on these habitats for food, water, shelter, and reproduction. The GAA for coastal habitats and fauna includes export cable landfalls, onshore export cable routes, the OnCS-DC, and the interconnection to the existing Holbrook Substation, from landfall at Fire Island to the Holbrook Substation (Figure D-6, Appendix D).

The affected environment and environmental consequences of Project activities that are within the GAA and extend into state waters (i.e., HDD for cable landfall and cable laying within 1 mi [1.6 km] of cable landfalls) are presented in Sections 3.7 *Benthic Resources*; 3.10 *Finfish, Invertebrates, and Essential Fish Habitat*; 3.11 *Marine Mammals*; 3.12 *Sea Turtles*; and 3.5 *Water Quality*. Additional information on birds, bats, and wetlands is presented in Section 3.8 *Birds*, Section 3.6 *Bats*, and Section 3.13, *Wetlands* respectively.

3.9.1 Description of the Affected Environment and Future Baseline Conditions

3.9.1.1 Regional Setting

Long Island is a detached segment of the relatively flat alluvial Atlantic Coastal Plain of the Atlantic coast of the United States that was subsequently covered by moraine deposits, glacial drift, and outwash materials from the most recent glaciation. The island slopes gradually southward from an elevation of roughly 200 ft (60 m) from rocky shores and cliffs on the north side of the island to sandy beaches, marshes, mudflats, and barrier islands on the south shore. Relatively rare pine barrens and the nation's

only maritime dune grasslands occur on the mainland (Griffith 2010; Sohl 2003). Maritime beaches, dunes, and forests occur along the coastal mainland and the barrier islands.

The bays along the south shore have an average depth of 6.5 ft (1.9 m) (Wilson et al. 1991) and an average salinity of 25.9 parts per thousand (ppt) (Tanski et al. 2001), compared to approximately 35 ppt in seawater and 0.5 ppt in fresh water. Approximately 70 mi (112.7 km) of the south shore, from mean high tide on the ocean side of the barrier islands to the inland limits of the mainland watersheds, are designated as the South Shore Estuary Reserve (SSER Council 2021). The estuary includes 173 mi^2 (448.1 km^2) of shallow bays behind (landward of) the barrier islands and 19,000 ac (76.9 km^2) of vegetated tidal wetlands. The tidal marshes, mud and sand flats, SAV, and broad shallows of this estuarine environment support finfish, shellfish, waterfowl, and other wildlife in the South Shore Estuary Reserve.

Climate change affects these and other coastal habitats due to factors such as sea level rise, increases in the number of storms, and subsequent erosion and habitat loss. Climate change factors also accounted for the loss of approximately 3.4 million ac (13,682 km^2) of forested coastal wetlands across the north Atlantic coastal plain between 1996-2016 (White et al. 2021). A climate change assessment of Fire Island National Seashore (Ricci et al. 2020) predicted vulnerability of coastal habitats and fauna to climate change and found saltmarshes, maritime forests, freshwater ecosystems, and coastal herpetofauna to be the most vulnerable to loss, with little capacity to adapt to climate change. Coastal habitats are considered highly vulnerable to the impacts of climate change, including non-climate stressors such as coastal development (Farr et al. 2021).

3.9.1.2 Barrier Islands

Barrier island shorelines are continually reworked by waves and tidal action and can change on a daily, seasonal, or annual basis, especially in response to severe weather events. For example, in 2012, Hurricane Sandy's wave energy and storm surge resulted in the loss of an average of 54-percent volume in beaches and dunes across Fire Island, with more than 75 percent of the volume loss estimated near the ICW at Smith Point (USGS 2013). Island widths along the south shore typically vary between 984 ft and 2,625 ft (300 m and 800 m) in width. Fire Island, one of five barrier islands along the south shore of Long Island (Tanski et al. 2001), is the landfall site for the Project. Like other barrier islands, it migrates landward due to the transfer of sand from the ocean to the bay side (Nordstrom and Jackson 2005), and breaches and washovers can form platforms that support seagrass meadows.

Vegetation patterns on Fire Island, inclusive of the Otis Pike Fire Island High Dune Wilderness, coincide with gradients of tidal inundation, salinity, and wind across the island from ocean to bay side (GPI 2008). The beaches have four zones: nearshore bottom (submerged areas below mean low water (MLW) to 29.5 ft (9.0 m); foreshore (intertidal areas between MLW to the high tide zone); backshore (exposed sandflats above high tide line to dunes, but occasionally submerged during storms or exceptionally high tides); and dunes that parallel the shore (areas of wind-blown sand ridges or mounds above the highest tide line and exposed to wind action) (USFWS 1997). Dune ridges often parallel the shoreline, and extensive sand flats, interdunal swales, and tidal marshes are behind the dunes. Plant species commonly

found seaward of the primary dune and on the foredune include American beach grass (*Ammophila breviligulata*), beach pea (*Lathyrus maritimus*), dusty miller (*Artemisia stelleriana*), seaside goldenrod (*Solidago sempervirens*), common saltwort (*Salsola kali*), seaside spurge (*Euphorbia polygonifolia*), and sea rocket (*Cakile edentula*). On the leeward side of the primary dune, less salt-tolerant woody vegetation such as beach plum (*Prunus maritima*), northern bayberry (*Myrica pensylvanica*), Virginia creeper (*Parthenocissus quinquefolia*), and poison ivy (*Rhus radicans*) are also present. Bearberry (*Arctostaphylos uva-ursi*) and beach-heather (*Hudsonia tomentosa*) may also be found in the swale or near secondary dunes. The federally threatened seabeach amaranth (*Amaranthus pumilus*) may also occur in the sandy beach portions of the Project Area.

Interdunal swales have freshwater inputs via groundwater and may be characterized by wetland species such as purple gerardia (*Agalinis purpurea*), sundews (*Drosera* spp.), large cranberry (*Vaccinium macrocarpon*), and highbush blueberry (*V. corymbosum*). Farther inland, bogs, maritime thickets/forest and salt marshes may be present. On Fire Island, highbush blueberry swamp shrub, northern interdunal cranberry swale, and reedgrass marsh (Klopfer et al. 2002) communities occur (Grossman et al. 1998). Plant species in the bogs include cranberry, highbush blueberry, swamp azalea, (*Rhododendron viscosum*), narrow leaved cattail (*Typha angustifolia)*, wool grass (*Scirpus cyperinus*), common reed *(Phragmites australis*), swamp maple (*Acer rubrum*), sour gum (*Nyssa sylvatica*), sphagnum moss (*Sphagnum* spp.*),* royal ferns (*Osmunda* spp.), marsh St. Johnswort (*Hypericum virginicum*), red chokeberry (*Pyrus arbutifolia*), inkberry (*Ilex glabra*), smartweed (*Polygonum* spp.), various species of sedge (*Carex* spp.), and rushes. Tidal marshes are present along the low energy bay side of Fire Island in broad overwash areas and common species include saltmarsh cord grass (*Spartina alterniflora*), salt-meadow cordgrass (*S. patens*) and coastal salt grass (*Distichlis spicata*), depending on the level of tidal inundation.

3.9.1.3 Mainland

Approximately 18 percent of the bay side of Long Island was bulkheaded by 2009 (Nordstrom et al. 2009), which increases shoreline erosion. Sediment supply is considered the greatest threat to bayside beaches (and is reduced by bulkheading and shoreline hardening, dredging for navigation access, and disposal of dredged material in uplands (Ricci et al. 2020). Developed land uses, primarily residential, have replaced or degraded much of the historical natural communities on the mainland. Residential and recreation and open lands make up 37 and 27 percent of the landcover, respectively, in the Town of Brookhaven, Suffolk County, where onshore Project facilities would be located (see Section 3.18 *Land Use* for further detail). Recreation and open land in the Town of Brookhaven include lands developed for recreation, such as Smith Point County Park and Southaven County Park. Wertheim National Wildlife Refuge (NWR) and Otis Pike Fire Island High Dune Wilderness within the Fire Island National Seashore Wilderness Area have very limited development. The Central Pine Barrens is a 105,000 ac (424.9 km^2) natural area created by the Long Island Pine Barrens Protection Act in 1993 and a prominent feature on the mainland and includes the headwaters for the Carmans River. Tidal marshes are present along the coast of the mainland and the estuarine portion of the Carmans River, while freshwater marshes and

forested wetlands occur farther inland and along the upper reaches of the Carmans River. Tidal marshes are analyzed in Section 3.13 *Wetlands and Other Waters of the United States*.

3.9.1.4 Significant Natural Communities and Habitats

The GAA for coastal habitats and fauna is within the state coastal area of New York, as described in the State of New York (1982) and the Long Island Sound Coastal Management Programs (1999), and the SSER Comprehensive Management Plan (SSER Council 2021). The GAA overlaps or is proximate to state and/or federal designations, including the NYSDEC Critical Environmental Areas (CEAs), Significant Coastal Fish and Wildlife Habitats (SCFWH), New York Natural Heritage Program (NYNHP) Significant Natural Communities, Fire Island National Seashore and the Otis Pike Fire Island High Dune Wilderness, and the Central Pine Barrens, described below and mapped in Figure 4.4.1-2 of the COP (Sunrise Wind 2023).

3.9.1.5 Critical Environmental Areas

A portion of the landfall/ICW work area intercepts the Coastal Zone Area South CEA on the mainland. The onshore transmission cable traverses the CEAs for approximately 1 mi (1.6 km) along William Floyd Parkway from the ICW work area to Fawn Place and for approximately 0.7 mi (1.1 km) across the Carmans River. Onshore facilities in the CEAs are located primarily within existing developed areas such as parking lots and paved roadways.

3.9.1.6 Significant Coastal Fish and Wildlife Habitats

- There are four NYSDOS-designated SCFWHs that are intercepted or directly adjacent to onshore transmission facilities. These are described below and corresponding locations with respect to onshore facilities are listed in Table 3.9-1. ***Great South Bay – East:*** This SCFWH includes the Great South Bay and ICW crossing from the landfall/ICW work area on Fire Island to the landfall/ICW work area on mainland, west of and including, the Smith Point Bridge. It is the largest protected, coastal bay in the state of New York, provides feeding and nesting habitat for several rare, threatened, and endangered (RTE) avian species, and supports one of the largest concentrations of wintering waterfowl in the state of New York (NYSDEC 2008a).
- ***Moriches Bay – West:*** The Moriches Bay SCFWH is just east of the Smith Point Bridge. Like Great South Bay, it is a large, protected, bay and provides feeding and nesting habitat for numerous species of fish and shellfish, avian species, and rare plants (NYSDEC 2008c).
- ***Carmans River:*** The proposed transmission cable crosses approximately 70 ft (21 m) of the Carmans River. The Carmans River SCFWH is undeveloped and one of four major rivers on Long Island. Rare species include the eastern tiger salamander (*Ambystoma tigrinum*), eastern box turtle (*Terapene carolina*), sea-run brown trout (*Salmo trutta*), and wild brook trout (*Salvelinus fontinalis*) (NYSDEC 2008d). The Carmans River flows through the Wertheim NWR, located approximately 350 ft (106.7 m) downstream of the proposed crossing.
- ***Smith Point County Park:*** The Smith Point County Park SCFWH is the location of the landfall/ICW work area on Fire Island. The SCFWH is one of the largest segments of undeveloped barrier beach on

Long Island. It provides feeding and nesting habitat for several RTE avian species and supports populations of RTE plant species such as seabeach amaranth (*Amaranthus pumilus*) and seabeach knotweed (*Polygonum glaucum*). Park recreational use is high during the summer months and disturbance by pedestrian and off-road vehicle traffic is common (NYSDEC 2008b).

- ***Great South Bay – East:*** This SCFWH includes the Great South Bay and ICW crossing from the landfall/ICW work area on Fire Island to the landfall/ICW work area on mainland, west of and including, the Smith Point Bridge. It is the largest protected, coastal bay in the state of New York, provides feeding and nesting habitat for several RTE avian species, and supports one of the largest concentrations of wintering waterfowl in New York State (NYSDEC 2008a).
- ***Moriches Bay – West:*** The Moriches Bay SCFWH is just east of the Smith Point Bridge. Like Great South Bay, it is a large, protected, bay and provides feeding and nesting habitat for numerous species of fish and shellfish, avian species, and rare plants (NYSDEC 2008c).
- ***Carmans River*****:** The proposed transmission cable crosses approximately 70 ft (21 m) of the Carmans River. The Carmans River SCFWH is undeveloped and one of four major rivers on Long Island. Rare species include the eastern tiger salamander (*Ambystoma tigrinum*), eastern box turtle (*Terapene carolina*), sea-run brown trout (*Salmo trutta*), and wild brook trout (*Salvelinus fontinalis*) (NYSDEC 2008d). The Carmans River flows through the Wertheim NWR, located approximately 350 ft (106.7 m) downstream of the proposed crossing.

Table 3.9-1. Summary of Significant Coastal Fish and Wildlife Habitats, New York Natural Heritage Program Natural Communities and Critical Environmental Areas Intercepted by Proposed Onshore Facilities

Onshore Facility	Significant Coastal Fish and Wildlife Habitats	New York Natural Heritage Program Significant Natural Communities	Critical Environmental Areas
Landfall/ICW Work Area (Fire Island and Mainland)	Smith Point County Park Moriches Bay - West (adjacent) Great South Bay – East	Maritime beach and maritime intertidal gravel/sand beach Marine eelgrass meadow (adjacent) Marine Back-barrier lagoon (adjacent)	Not present
Onshore Transmission Cable Route	SCFWH Moriches Bay (adjacent to ICW HDD location) Great South Bay-East (ICW HDD) Carmans River crossing	Red maple-blackgum swamp (Carmans River) (300 ft [91 m] downstream of Sunrise Highway)	CEA South at ICW HDD and associated work area at Carmans River crossing; includes Central Pine Barrens
Onshore Connector Station (Union Avenue)	None	None	None
Onshore Interconnection Cable Route	None	None	None

Source: Verified data as reported in Appendix L of the COP (Stantec 2022b)
Notes: CEA = Critical Environmental Area; ICW = intracoastal waters; HDD = horizontal directional drilling; SCFWH = Significant Coastal Fish and Wildlife Habitats

3.9.1.7 Significant Natural Communities

Five significant natural community types were identified by the NYNHP (see agency correspondence in Appendix C of Appendix L of the COP, Stantec 2022b) as intercepted by or directly adjacent to the proposed onshore facilities. Although not intercepted, the Otis Pike Fire Island High Dune Wilderness within Fire Island National Seashore is adjacent to the west side of Smith Point County Park and included here.

- ***Maritime beach and maritime intertidal gravel/sand beach:*** These communities are part of a 32 mi (51.5 km) maritime community that is partially within the Smith Point County Park SCFWH on Fire Island where landfall of the transmission cable is planned. Maritime beaches occur on unstable sand, gravel, or cobble shores above the MHWL, are continually modified by wave and wind action, and are sparsely vegetated with beach grass (NYSDEC 2008b; Edinger et al. 2014).
- ***Marine eelgrass meadow:*** Extensive eelgrass (*Zostera marina)* meadows are present in Narrow Bay between Smith Point County Park on Fire Island and Smith Point Marina on the mainland. The grass beds provide spawning and foraging habitat for mollusks, crustaceans, juvenile fish, and diving ducks and help stabilize sediments (NYSDEC 2008a; Edinger et al. 2014). Further discussion of SAV is provided in Section 3.10, *Finfish, Invertebrates, and Essential Fish Habitat*.
- ***Marine back-barrier lagoon:*** A large marine back-barrier lagoon occurs in parts of Great South Bay and Moriches Bay near the landfall/ICW work area, surrounded by developed lands. The protected shores of the lagoons support grass beds, mudflats, and salt marshes.
- ***Red maple-blackgum swamp:*** Red maple (*Acer rubrum*)–blackgum swamp is present approximately 300 ft (91 m) south of the LIE Service Road along the eastern side of the Carmans River. Dominant species include black tupelo (*Nyssa sylvatica*) and red maple, along with understory species such as clammy azalea (*Rhododendron viscosum*) and coastal sweet pepperbush (*Clethra alnifolia*) (NYSDEC 2008d). Faunal information for this community is very limited (Edinger et al. 2014). Further discussion of this community type is presented in Section 3.13, *Wetlands and Other Waters of the United States*.
- **Otis Pike Fire Island High Dune Wilderness:** The Otis Pike Fire Island High Dune Wilderness is adjacent to Smith Point County Park on the west side of the park and is the only federally designated wilderness in the State of New York. The Wilderness is managed by NPS and stretches approximately 7 mi (11.3 km) west from the Wilderness Visitor Center adjacent to Smith Point County Park, west to Watch Hill, and includes approximately 1,363 ac (551.6 ha) of the Fire Island National Seashore. The Wilderness area provides backcountry camping opportunities and hiking, fishing, birdwatching, and nature viewing.
- **Central Pine Barrens:** The Central Pine Barrens occur in central western Long Island and undeveloped stretches of the bay sides of barrier islands (Central Pine Barrens Joint Planning & Policy Commission 2022), including the Long Island south shore. These pine barrens represent the largest remnant of a forest community that once encompassed more than 250 million ac (over 1,011 km^2). Pine barrens are fire-dependent and characterized by the presence of pitch pine (*Pinus rigida)*, but may be pine-or oak- dominated, with different proportions of the same species such as black huckleberry (*Gaylussacia baccata*), Blue Ridge blueberry (*Vaccinium pallidum*), and bear oak (*Quercus ilicifolia*). These communities are particularly recognized for the number of moth and butterfly species that rely on plants such as bear oak for survival and/or reproduction (Davis et al. 2005).

Development in the designated Central Pine Barrens Core Preservation Area is regulated, but it is not prohibited. Sunrise Wind's application for a Core Preservation Area Compelling Public Need and Hardship was granted in April 2022." The link to the approval document is: https://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=303480&MatterSeq=64180. The designated Central Pine Barrens Core Preservation Area includes approximately 52,500 ac (212 km^2) and approximately 47,500 ac (192 km^2) of the Compatible Growth Area, where development is permitted (Central Pine Barrens Joint Planning & Policy Commission 2022). The onshore transmission cable traverses the Core Preservation and Compatible Growth areas at and adjacent to the Carmans River crossing. The Central Pine Barrens Commission has identified mitigation measures for development within the Core Preservation Area. The Core Preservation Area is characterized by predominantly forested wetlands, including red maple-blackgum swamp and oak uplands. The Compatible Growth Area on either side of the Carmans River crossing is developed but includes scattered remnant pine barrens. The onshore transmission cable has been located to the greatest extent practicable within existing road ROWs within the Compatible Growth Area but includes two crossings of remnant pine barrens, one at Sunrise Highway crossing west of William Floyd Parkway and the other at the LIRR crossing.

3.9.1.8 Coastal Fauna

The onshore facilities are located entirely within the SSER, which is home to approximately 120 species of marine and coastal finfish, hundreds of birds, and a wintering territory for small numbers of marine mammals (Lynch 2017). Migratory shorebirds use the beaches, marshes, and especially the intertidal flats of Fire Island as feeding grounds (GPI 2008), feeding on invertebrates in the tidal flats, salt marshes, and ocean beaches in the area and resting on beaches. The habitats in Moriches Bay near the inlet are recognized as one of the best and most consistent shorebird concentration areas on Long Island, primarily in the fall.

Shorebirds, waterfowl, and wading birds are the primary terrestrial species in this area other than the abundant deer and fox (GPI 2008). Birds likely to occur within or proximate to the onshore facilities are provided in Table 4.4.6-4 in the COP (Sunrise Wind 2023), based on the NYS Breeding Bird Atlas (2000–2005). Terrestrial birds such as songbirds occur and breed in a variety of upland and coastal habitats and are only present offshore during migration. Hawk species (e.g., ospreys, harriers) breed and forage in upland habitats and pass through the area during migration. Bald eagles (*Haliaeetus leucocephalus*), protected under the Bald and Golden Eagle Protection Act of 1940 (as amended in 1962) have a year-round presence in the region (NYSDEC 2008b), are present year-round in the region and have been slowly increasing in numbers over the last 30 years. Bald eagles have also returned to Long Island (NYSDEC 2008b).

Dunes on Fire Island are habitat to species such as red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), and whitetail deer (*Odocoileus virginianus*). Fire Island also supports a major breeding population of the state endangered eastern mud turtle (*Kinosternon subrubrum*), which inhabits a variety of wetland habitats including ponds and freshwater and brackish marshes (Cook et al. 2010) and is considered critically imperiled at this northern edge of its distribution. This species is found in only seven wetland complexes on Long Island and nearby islands and the population is declining in all but one (NYNHP 2013).

3.9.1.9 Federally Listed Rare, Threatened, and Endangered Species and Designated Critical Habitat

The NYNHP lists known occurrences of several RTE plant species within the vicinity of the transmission cable corridor and other areas associated with onshore facilities (see agency correspondence in Appendix C of Appendix L of the COP, Stantec 2022b). A USFWS Information for Planning and Consultation (iPaC) query indicated known occurrences of two federally listed plant species in the vicinity of the onshore facilities. Table 3.9-2 provides a list of the known RTE plant occurrences and potential habitat for those species associated with the onshore facilities. Red maple-blackgum swamp is present in Southaven County Park, within 0.2 mi (321.9 m) of the onshore transmission cable and is potential habitat for RTE plant species blunt-lobed grape fern (*Botrychium oneidense*), Collins' sedge (*Carex collinsii*), and water pigmy weed (*Crassula aquatica*), although the potential habitat is outside the proposed work areas and none of these species were found during field surveys. Similarly, potential habitat in a remnant pine barren was surveyed for sandplain wild flax (*Linum intercursum*), a species listed as threatened by NYSDEC and noted to occur proximate to the OTC, was not found. However, incidental observations were made of two state-listed species and one rare species: state-threatened little ladies' tresses (*Spiranthes tuberosa*) and Stuve's bush-clover (*Lespedeza stuevei*), and sickle-leaved golden aster (*Pityopsis falcata*, listed as rare on the NYNHP Watch List), respectively.

Seabeach amaranth (federally threatened) may occur in the maritime beach community at the landfall/ICW work area where suitable habitat is present. There is a documented occurrence of the species approximately 1 mile (1.6 km) from the onshore project components and seabeach amaranth may occur in the sandy beach portions of the Project Area. Field surveys noted that the extensive recreation use and associated impacts from pedestrian and vehicle traffic in this location substantially limit the likelihood of seabeach amaranth occurrences (Appendix L of the COP, Stantec 2022b), however, areas fenced to protect plovers and terns would also provide potential habitat for seabeach amaranth. Potentially suitable habitat for sandplain gerardia is provided in the northern portion of the landfall/ICW work area on Fire Island within the maritime shrubland community north of the parking area. This community supports maritime grassland-associated species interspersed within sandy openings amongst patches of shrubs. Potential habitat for sandplain wild flax is provided in the maritime dune community within the landfall/ICW work area, particularly in the stable back dune areas. Potentially suitable habitat is available in the maritime shrubland community in areas noted above for sandplain gerardia.

The NYNHP identified an occurrence of hairy-necked tiger beetle (*Cincindela hirticollis*), a rare but unlisted species associated with sand beaches, near the landfall/ICW work area on Fire Island (see agency correspondence in Appendix C of Appendix L in the COP, Stantec 2022b). A review of aerial imagery indicates that the ICW HDD work area contains exposed sandy areas and field surveys, noted the maritime dune community, provides potentially suitable habitat for hairy-necked tiger beetle. In addition, the NYNH identified two unlisted but rare fish occurrences within the Carmans River near the OTC: eastern pirate perch (*Aphredoderus sayanus*) and Atlantic silverside (*Menidia menidia*). The river reportedly provides important nursey habitat for striped bass (*Morone saxatilis*) and spawning and nursey habitats for alewife (*Alosa pseudoharengus*), Atlantic menhaden (*Brevoortia tyrannus*), white perch (*Morone americana*), and Atlantic silverside (NYSDEC 2008d). Field surveys confirmed that aquatic habitats of Carmans River provide potentially suitable habitat for both these species (Appendix L of the COP, Stantec 2022b). A USFWS iPaC database query did not indicate occurrences of federally listed fish or

non-avian or bat wildlife species in or proximate to the onshore facilities. A query of the New York Nature Explorer database indicates that several other species of fish and non-avian wildlife are known to occur within the Town of Brookhaven (Appendix B of Appendix L of the COP, Stantec 2022b). Several RTE species of moths and butterflies may also occur in the pine barrens (Davis et al. 2005), as noted earlier.

Table 3.9-2. Rare, Threatened, and Endangered and NYS Watch List Plant Species Documented by NYSDEC, USFWS, or Field Surveys Potentially Intercepted or Occurring in the Vicinity of Proposed Onshore Facilities

Project Component	Species	State Listing	Federal Listing	Habitat Association	Approximate Location	Field Results
Landfall/ICW Work Area	Sandplain Gerardia[1] *Agalinis* acuta	Endangered	Endangered	Maritime grassland and shrubland	No location information provided	None observed within area[3]; potential habitat at landfall/ICW work area but outside of landfall and ICW work area
	Seabeach Amaranth[1] *Amaranthus pumilus*	Threatened	Threatened	Maritime beach	No location information provided	None observed[3], potential habitat at landfall/ICW work area but outside of landfall and ICW work area
Onshore Transmission Cable Work Area: Long Island Expressway Service Road Route[4]	Blunt-lobed Grape Fern[2] Botrychium oneidense	Threatened	NL	Floodplain forest, red maple-blackgum swamp	Southaven County Park, within 0.2 mi (0.3 km) of onshore transmission cable; in wet soil under shrubs and vines in red maple swamp	None observed[3]; potential habitat in wetlands associated with Carmans River and Southaven County Park but outside of proposed work areas
	Collins' Sedge[2] Carex collinsii	Endangered	NL	red maple-blackgum swamp	Southaven County Park, within 0.2 mi (0.3 km) of onshore transmission cable; abandoned fish hatchery (part of Suffolk County Park) in a red maple-tupelo swamp	None observed[3]; potential habitat in wetlands associated with Carmans River and Southaven County Park but outside of proposed work areas
	Water Pigmyweed[2]	Endangered	NL	Freshwater intertidal	Within 0.2 mi (0.3 km) of	None observed[3],

Project Component	Species	State Listing	Federal Listing	Habitat Association	Approximate Location	Field Results
	Crassula aquatica			mudflat, freshwater intertidal shore, and freshwater tidal marsh	onshore transmission cable; Carmans River, west side immediately south of Montauk Highway; bank of an intertidal section of river at a road embankment	potential habitat in Carmans River but outside of proposed work areas
	Sandplain Wild Flax[2] *Linum intercursum*	Threatened	NL	Maritime dunes, maritime grassland, maritime shrubland, and pitch pine-scrub oak barrens	Within 0.6 mi (1.0 km) of onshore transmission cable: Station Avenue roadside; plants are on a roadside along pine barrens with very sparse vegetation, dominated by grasses and legumes	None observed; minimal potential habitat; potentially suitable habitat associated with Revilo Avenue work area was surveyed but no sandplain wild flax specimens were observed
	Little Ladies' Tresses[4] *Spiranthes tuberosa*	Threatened	NL	Pitch Pine – Scrub Oak Barren	No location information provided	Observed in vicinity but outside proposed work area
	Stuve's Bush-clover[4] *Lespedeza stuevei*	Threatened	NL	Pitch Pine – Scrub Oak Barren	No location information provided	Observed in vicinity but outside proposed work area
	Sickle-leaved Golden Aster[4] *Pityopsis falcata*	Rare (Watch List)	NL	Pitch Pine – Scrub Oak Barren	No location information provided	Observed in vicinity but outside proposed work area

[1] Source: USFWS Information for Planning and Consultation (iPaC). Accessed March 11, 2020 and April 19, 2021, as reported in Appendix L of the COP (Stantec 2022b).

[2] Source: New York NHP Correspondence, March 27, 2020, and April 15, 2021, as reported in Appendix L of the COP (Stantec 2022b

[3] Field surveys for rare, threatened, and endangered (RTE) plants evaluated the potential for suitable habitat within the onshore facilities and were not targeted surveys to determine potential presence/probable absence of species, as reported in Appendix L of the COP (Stantec 2022b).

[4] Source: September 8, 2021 field survey, as reported in Appendix L of the COP (Stantec 2022b).

3.9.1.10 Onshore Facilities

Coastal habitats associated with the landfall/ICW work areas on Fire Island include maritime beaches, dunes, and grasslands. The landfall/ICW work on Fire Island includes the work area in Smith Point County Park, the adjacent HDD conduit stringing area, and Smith Point Marina on the mainland. Assembly would include welding and short-term placement of assembled HDD conduit sections along approximately 3,500 ft (1,067 m) of beach.

The landfall/ICW work area on the mainland is primarily developed, including a paved parking lot and areas of beach and dune communities along the beach side and to the west and east of the parking lot of Smith Point County Park. Otis Pike Fire Island High Dune Wilderness is directly adjacent to the west side of Smith Point County Park. Landfall/ICW Work Areas on Fire Island would be largely confined to the existing, paved Smith Point County Park parking lot, Burma Road, and maintained recreational fields located west of William Floyd Parkway. HDD conduit stringing may occur on Burma Road within Smith Point County Park, in an area located onshore south of the Smith Point County Park camping area., with the exception of cable stringing on the beach. Coastal habitats in the landfall/ICW work area on the mainland include beach and dune communities located along the south side of the mainland and associated interdunal areas. The onshore facilities would be located mostly within existing developed areas including parking lots and paved roadways.

More detailed information concerning coastal and terrestrial habitat, including the results of NYSDEC and USFWS data requests, desktop assessment, and field surveys are presented in Appendix B of Appendix L in the COP, Stantec 2022b.

3.9.2 Impact Level Definitions for Coastal Habitat and Fauna

This Final EIS uses a four-level classification scheme to analyze potential impact levels to coastal habitat and fauna from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning.

Table 3.9-3 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for coastal habitat and fauna. Table G-8 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to coastal habitat and fauna.

Table 3.9-3. Definition of Potential Adverse and Beneficial Impact Levels for Coastal Habitats and Fauna

Impact Level	Definition of Adverse Impact Levels	Definition of Beneficial Impact Levels
Negligible	Either no effect or no measurable impacts	Either no effect or no measurable impacts
Minor	Small, detectable, measurable, adverse impacts to habitat and/or fauna (abundance, diversity of both common and special-status species); localized; complete recovery anticipated without remedial or mitigating actions within a year; impacts avoidable.	Small and measurable effects that would increase the extent and quality of habitat for both special-status species and species common to the Lease Area and/or increase in populations of species common to the Lease Area.
Moderate	Notable and measurable adverse impacts to the extent and quality of local habitat for common and special-status species, the abundance or diversity of species, would occur and some may be irreversible; or the affected resource would recover completely with remedial or mitigating activities with a specified time frame.	Notable and measurable effects comprising an increase in the extent and quality of local habitat for both special-status species and species common to the Lease Area and/or an increase in individuals or populations of species common to the Lease Area.
Major	Measurable and widespread (population-level or regional) impacts to the extent and quality of local habitat for common and special-status species and the abundance or diversity of species would occur; some impacts may be irreversible; full recovery not anticipated even with remediation or mitigation.	Regional or population-level increase in the extent and quality of habitat for both special-status and commonly occurring species.

3.9.3 Impacts of Alternative A - No Action on Coastal Habitat and Fauna

When analyzing the impacts of the No Action Alternative on coastal habitat and fauna, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities, on the baseline conditions for coastal habitat and fauna. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.9.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for coastal habitat and fauna described in Section 3.9.1, *Affected Environment*, would continue to follow current regional trends and respond to IPFs introduced by other non-offshore wind and offshore wind ongoing activities. Ongoing non-offshore wind activities within the GAA that contribute to impacts on coastal habitat and fauna are generally associated with onshore impacts, including onshore residential, commercial, and industrial development, and climate change. Onshore construction activities and associated impacts are expected to continue at

current trends and have the potential to affect coastal flora and fauna through short-term and permanent habitat removal or conversion, short-term noise impacts during construction, and lighting, which could cause avoidance behavior and displacement of animals, as well as injury or mortality to individual animals or loss and alteration of vegetation and individual plants. However, population-level effects would not be anticipated. Climate change and associated sea level rise can cause dieback of coastal habitats due to rising groundwater tables and increased saltwater inundation from storm surges and exceptionally high tides (Sacatelli et al. 2020). Climate change may also affect coastal habitats through increases in instances and severity of droughts and range expansion of invasive species. Warmer temperatures would cause plants to flower earlier, would not provide needed periods of cold weather, and would likely result in declines in reproductive success of plant and pollinator species. Reptile and amphibian populations may experience shifts in distribution, range, reproductive ecology, and habitat availability. Increased temperatures could lead to changes in mating, nesting, reproductive, and foraging behaviors of species, including a change in the sex ratios in reptiles with temperature-dependent sex determination. The effects of climate change on animals would likely include loss of habitat, population declines, increased risk of extinction, decreased reproductive productivity, and changes in species distribution (NJ DEP 2020).

Other planned non-offshore wind activities that may affect coastal habitat and fauna primarily include increasing onshore development activities (see Appendix E for a description of planned activities scenarios). Similar to ongoing activities, other planned non-offshore wind activities may result in short-term and permanent impacts on animals and vegetation, including disturbance, displacement, injury, mortality, habitat and plant degradation and loss, and habitat conversion.

3.9.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Under the No Action Alternative, the proposed Project would not be built and impacts to coastal habitats and fauna described in the following section would not occur, although this does not preclude the implementation of future offshore wind projects in the region. Impacts from future offshore wind and other activities such as increased land development and the impacts of climate change would continue and corresponding impacts to coastal habitats and fauna would persist.

Other planned and non-offshore wind activities that may affect coastal habitat and fauna include new onshore cables and pipelines, onshore construction, port expansions, and development projects (e.g., residential, commercial, industrial). Future projects would contribute to individual displacement, injury, mortality, and habitat loss with respect to coastal habitats and fauna primarily due to land disturbance, but also accidental releases, air emissions, anchoring, cable emplacement, discharges, light, noise, presence of structures, and traffic. Activities from these projects may be short-term, long-term, or permanent, depending on the amount of land disturbance and the timing and duration of the disturbance.

Potential cumulative impacts of planned offshore wind activities, including construction, O&M, and decommissioning of project, on coastal habitats and fauna are summarized below for each relevant IPF.

Accidental releases of fuel, fluids, or hazardous materials would potentially contaminate coastal habitats such as salt marshes and beaches, and fauna such as snails, crabs, and mollusks (discussed in Sections 3.7 and 3.10) due to the release and/or cleanup activities. Accidental releases of fuel from offshore structures and offshore vessels would not likely reach coastal habitats, however. The most likely release is diesel fuel, but the expected size of such a spill is likely to have negligible, localized, and short-term impacts to coastal habitats. Accidental disposal of trash into the water and coastal habitats represents a risk to fauna such as small mammals, birds, herpetofauna, and fish that may ingest or become tangled in the debris. Proper waste management procedures would reduce the potential for trash or debris to be inadvertently left in coastal habitats or waters. The cumulative impacts of accidental releases on coastal habitats are likely to be localized, short-term, and result in negligible impacts to coastal habitats.

Anchoring from small boats may occur along the shoreline during transmission cable landfall activities from the ocean side, potentially increasing turbidity and causing physical damage to coastal habitats such as seagrass beds and hard-bottom habitats (see Sections 3.7 and 3.10). Anchoring close to shore for crew and equipment transport may result in physical disturbance or damage to beaches and/or salt marshes. These impacts would be localized and short-term. Any turbidity would be short-term. Impacts to coastal habitats due to anchoring are expected to be short-term and negligible.

Air emissions from vehicles and heavy machinery (e.g., drill rig, excavation and backfilling equipment, building construction) used in the construction of onshore facilities would result in short-term and localized increases in air pollutants (see Section 3.4). The effects of air pollutants on biogeochemical cycling are well documented, although the effects on most terrestrial organisms and the interaction of air pollution with other stressors are less well understood (Lovett et al. 2009). However, onshore facilities equipment and fuel suppliers would comply with the applicable USEPA or equivalent emission standards and construction and O&M emissions would have negligible to minor, and short-term impacts on coastal habitats and fauna. Long-term benefits of offshore wind include reduced carbon emissions and air pollutants such as nitrogen oxides, sulfur oxides, and mercury, compared with oil and coal combustion (Allison et al. 2019).

Cable emplacement into a trench or as part of a HDD crossing would result in negligible impacts to the environment. However, the cable cannot be installed without the corresponding land disturbance associated with trenching, HDD, traffic, structures, and other activities required to build the containment for the cable. The impacts of cable emplacement would be localized and short-term and no greater that that described for land disturbance and other activities required for the installation. Cables buried deeply enough that the surface protection would not be needed would have no impact on coastal habitats.

Discharges of drilling slurry during HDD at landfall would occur during Project installation and construction. Where HDD is used, an Inadvertent Return Plan would be prepared and implemented to minimize the potential risks associated with the release of drilling fluids. Discharges from vessels are not permitted within 3 nm of shore and are not expected to impact coastal habitats. Onshore construction activities such as trenching may require dewatering and BMPs would be used such as diversion, filtering, and energy dissipation devices. Dewatering activities would be short-term, and water drawdown would

be minimal. All earth disturbances from construction activities would comply with State Pollutant Discharge Elimination System General Permits for Stormwater Discharges associated with construction activities and the approved SWPPP for the Project. The likelihood of impacts to coastal habitats and fauna as a result of discharges from the proposed Project are negligible.

Land disturbance is expected to account for the greatest amount of impact to coastal habitats and fauna when compared to other IPFs. Land disturbance would result from construction and installation of transmission cables and associated infrastructure and an OnCS-DC construction. Habitats disturbed during trenching and cable installation would be reseeded with native vegetation where practicable. Total lengths of transmission cable corridor for onshore facilities are much smaller when compared with offshore cables and most of the OTCs are placed within ROWs, utility clearances, and/or other developed areas thereby avoiding habitats and fauna. Onshore activities such as pipe stringing may occur on beaches and would disturb vegetation and fauna for the duration of Project construction. Impacts of these activities are anticipated to be minor to moderate.

Adverse impacts to habitats would occur along cable routes due to trenching, vegetation removal, soil compaction, surface water runoff or pooling, and potential inadvertent burial of vegetation and fauna during construction ROW and locations where the transmission cable installation changes between trenching and HDD. With few exceptions, trenching and burial of transmission cable would be limited to previously disturbed areas, such as transportation ROWs. Trenchless cable crossings (i.e., HDD and jack-piping) are typically used to avoid sensitive environmental areas such beaches, wetlands, and river crossings. For cable installations outside of roadways, such as greenbelt areas, areas would typically be backfilled to the original grade elevation and hydroseeded to prevent soil erosion.

Negligible impacts to coastal habitats are anticipated from areas disturbed by the OnCS-DC facilities because these facilities are generally constructed in already developed areas. Construction of the transmission cable and interconnection facility would provide opportunities for the introduction and establishment of invasive species that would subsequently pose a risk to native vegetation and fauna. In ROW areas, impacts would be short-term and negligible given the areas are already disturbed. In undisturbed habitats, the potential risk is much higher. An Invasive Species Management Plan would be implemented to avoid and manage the introduction and spread of invasive plant species that would likely have negative impacts on native plants and coastal habitat.

Certain work activities (e.g., HDD conduit stringing and tree removal) would result in impacts to coastal habitat and RTE species, such as seabeach amaranth during times of establishment and flowering. Impacts to biologically significant times of year for sea turtles and shore birds are addressed in Sections 3.12 and 3.8, respectively.

Construction activities may also contribute to erosion and sedimentation during construction and result in impacts to sensitive environmental resources. Disturbed habitats are expected to return to their previous condition following construction completion without further restoration. Displaced mobile wildlife would repopulate former habitats once construction is complete and the habitat would recover to pre-construction conditions. Since construction occurs predominantly in already developed areas where wildlife is habituated to human activity regardless of the cable route chosen, impacts of land disturbance would be short-term and negligible to minor because very little construction associated with cable transmission corridors occurs in undisturbed areas.

Maintenance such as periodic clearing of vegetation along existing utility ROWs and other activities to maintain public utilities disturbs and temporarily displaces mobile fauna and may result in injury or death of less-mobile species, albeit at a local level. Clearing and conversion of coastal habitats to developed uses results in permanent loss of the habitat for fauna. Outside currently protected areas, the conversion of natural areas to developed residential, commercial, and industrial uses is expected to continue.

Lighting impacts to coastal habitats and fauna in the GAA from vessels transiting to/from the landfall and coastal work locations or from vessels installing cables in the GAA would occur primarily during construction. Light may emanate from onshore structures associated with the Project construction onshore. The extent of impacts would be limited to the immediate vicinity of the lights, and the intensity of impacts on coastal habitats would likely be undetectable and negligible.

Noise from offshore wind construction activities is not expected to be noticeable in onshore coastal habitats and fauna due to the distance to the offshore activities. Noise pollution is a reported threat to terrestrial fauna such as amphibians, reptiles, and invertebrates, which are already highly threatened (Sordello et al. 2020) and noise would be expected from onshore construction activities. Noise from activities such as trenching and HDD of export cables and construction of onshore facilities, would disturb and displace coastal fauna that may be present during construction. Since construction would occur primarily in already developed ROWs where wildlife is absent or already habituated to human activity and noise, adverse impacts are not anticipated in most places. In potentially sensitive areas outside of ROWs, noise is expected to cause short-term displacement of fauna into adjacent available habitat, although fauna could return. Noise is also anticipated intermittently during construction and O&M phases with similar results. Therefore, impacts to fauna would be short-term and temporary, resulting in negligible to minor impacts.

Presence of structures such as onshore transmission cables and associated facilities along the proposed transmission route is expected to convert existing habitats to hard-top and/or impervious surfaces for cable protection and facilities such as the converter station. These changes would occur during construction and persist as long as the structures remain, resulting in permanent, but minor, habitat loss along the transmission corridor. Cables buried deeply enough that surface protection would not be used would have no impact on coastal habitats and fauna. OnCS-DC facilities would be constructed in a compatible area of industrial or commercial land use and would therefore have negligible impacts on coastal habitats and fauna.

Traffic from vessels and onshore traffic may impact coastal habitats and fauna via physical disturbance of habitats and/or collisions with fauna such as small mammals, birds, and herpetofauna, and/or compaction or crushing of vegetation. Vessel traffic associated with offshore wind energy development may increase during landfall/ICW work activities. Loss or disturbance of coastal habitats such as beaches and marshes could occur due to wake erosion from vessel traffic associated with offshore wind energy but would be limited to approach channels and the coastal areas near ports and bays. Given the amount and nature of vessel traffic into and out of these ports, the small size and number of vessels associated with the Project would result in negligible to minor increases, if any, to wake-induced erosion of associated channels.

Onshore vehicle traffic detours during construction of onshore facilities may increase the number of vehicles along more sensitive alternative routes. Traffic delays may cause travelers to detour through more sensitive areas where coastal habitats and vegetation would be disturbed by increased traffic noise, debris from road and vehicles, and potential collisions with wildlife or off-road detours that damage vegetation may occur. Collisions between wildlife and vehicles or construction equipment would be rare because most individuals are expected to avoid construction areas. However, species with limited mobility, especially herpetofauna, would be more vulnerable to this impact, resulting in minor, short-term, adverse impacts to some species. Traffic disruptions would result in additional noise and dust, typical of other utility construction projects. These impacts would be short-term and overall, impacts to coastal habitats from traffic would be negligible to minor.

Climate change effects on seasonal timing and patterns of species distributions and ecological relationships would continue, resulting in permanent and ongoing changes in coastal habitats, with corresponding impacts on associated fauna. The landward migration of the barrier island shoreline would continue, and sea level rise would ultimately alter the amount and types of coastal habitat available (NPS 2020). Climate change, sea level rise, and other ongoing activities and planned actions would continue to result in the compression of coastal habitats as sea levels rise and reduces the extent of undeveloped coastal areas.

Offshore wind projects that reduce the need for carbon-based fuels such as oil and coal could result in simultaneous and substantial reductions in cumulative carbon emissions (Allan et al. 2020), increases in which are a substantial cause of rising earth temperatures (Lindsey 2020). Loss of coastal vegetation such as seagrasses would reduce the amount of carbon sequestration in the ocean (i.e., blue carbon). Therefore, long-term effects of the Proposed Action may be beneficial to coastal habitats and fauna by helping to reduce the impacts of ongoing climate change on these resources, although this is tempered by the potential reduction in carbon sequestration.

3.9.3.3 Impacts of Alternative A on ESA-Listed Species

Impacts of future and ongoing projects to ESA-listed plant and faunal species in the GAA would contribute to individual displacement, injury, mortality, and habitat loss or modification via noise, land disturbance, vehicle collisions, and climate change. Cable installation impacts to listed species are unlikely due to installation in primarily ROWs and other developed areas; impacts that may occur would not be permanent, and species would likely return to disturbed areas following completion of construction, depending on the amount of land disturbance. Permanent loss of habitat due to construction of buildings such as converter stations is also unlikely because onshore facilities are typically constructed in already developed areas.

Adverse impacts to ESA-listed species from the No Action Alternative would include impacts of future offshore wind projects, which would be the same as those described for the Proposed Action. The two federally listed plant species (seabeach amaranth and sandplain gerardia) in the vicinity of the work area would be affected by future offshore wind projects if the project footprint coincided with the species location(s). Potential impacts to birds and bats are addressed in Sections 3.6 *Bats* or 3.8 *Birds*.

3.9.3.4 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, coastal habitats would continue to respond to and reflect current regional trends and current and future environmental and societal activities such as ongoing coastal development. Conditions of coastal habitats in the GAA are relatively stable but can change. For example, marine eelgrass habitats are in decline, with a loss of over 20 percent from 1994 to 2011 (Costello and Kenworthy 2011). The impacts of ongoing activities, especially land disturbance due to development, would be potentially **moderate,** primarily due to ongoing trends in land disturbance and continued climate change.

Offshore wind impacts to coastal habitats and fauna under the No Action Alternative would continue due to erosion, sea level rise, and land development, particularly residential uses, consistent with current regional trends in ongoing and planned activities, including offshore wind project impacts. Construction activities may result in loss of coastal habitat and short-term or permanent displacement and injury or mortality of individual animals, but population-level effects would not be expected. Land disturbance activities associated with development and maintenance would contribute to elevated levels of erosion and sedimentation and accidental releases of fuels or hazardous material discharges of effluent and debris would continue due to ongoing coastal construction and marine activities.

Cumulative Impacts of the No Action Alternative

Future projects would contribute to individual displacement, injury, mortality, and habitat loss or modification via noise, land disturbance, vehicle collisions, and climate change. Cable installation impacts from these projects would not be permanent, and fauna would likely return to disturbed areas following completion of construction, depending on the amount of land disturbance. Permanent loss of habitat due to construction of buildings such as converter stations would be significant if located in sensitive habitats.

Future offshore wind activities are expected to affect coastal habitat and fauna via the primary IPFs presented for the Proposed Action and have similar impacts, resulting in minor impacts to coastal habitats and fauna. More specifically, those IPFs resulting in negligible cumulative impacts include accidental release of fuels, fluids, and hazardous materials; anchoring; discharges, cable emplacement, light, and presence of structures; IPFs resulting in negligible to minor cumulative impacts include land disturbance, noise, and traffic. While air emissions would produce negligible to minor cumulative impacts, reduced overall emissions would result in long-term benefits to the environment.

However, considering the combined effects of IPFs on coastal habitats and fauna, the overall impacts associated with future offshore wind activities, combined with ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable planned actions other than offshore wind would be **moderate** adverse. Land disturbance is expected to continue to have the greatest impact on the condition of coastal habitats and fauna in the GAA.

3.9.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on coastal habitats and fauna:

- Landfall short-term disturbance (onshore) of up to 6.5 ac (0.02 km^2), including the ICW HDD Landfall Work Area, for one landfall HDD and corresponding work area, temporary anchoring walls, and drilling rig, in addition to 2.5 ac (0.01 km^2) for the beach stringing area and trenching to the ICW crossing (Table 3.3.3-2 Landfall HDD Maximum Design Scenario and Table 3.3.3-3 Maximum Disturbance Areas for SRWEC Landfall in COP, Sunrise Wind 2023).
- Temporary landing structure, connecting ramp, and stabilizing spuds used for materials and equipment transport adjacent are anticipated. The pile-supported trestle (i.e., temporary landing structure) would include direct short-term impacts of up to 1,500 ft2 (139.4 m2) of SAV and/or benthic macroalgae due to direct ground disturbance and shading. No recent SAV or benthic macroalgae habitats were mapped in these areas based on the 2020 video survey (see Table 3.4.1-1; Figure 3.4-1 of COP Appendix N1, Stantec 2022a), although historical data from 2018 and 2002 indicate presence of 0.8 ac (3,237.5 m^2) and 0.3 ac (1,214.1 m^2) of SAV in the areas east and west of ICW crossing, respectively, and a pre-construction SAV survey would be conducted prior to construction to confirm current presence of SAV. The likelihood of impacts to intertidal and subtidal vegetated habitats would be considered very low given that the proposed temporary landing structure would be positioned to avoid and minimize impacts to these sensitive habitats to the extent practicable. The temporary landing structure may need to remain in place year-round but the use would be limited to fall and spring. The temporary landing structure may be used during two construction periods since the landfall HDD, ICW HDD, and SRWEC pull-in may occur in different years.
- Onshore transmission cable, including associated transition joint bay and fiber optic cable, up to 17.5 mi (28.2 km) long, with a temporary disturbance corridor of 30 ft (9.1 m) and maximum duct bank target burial depth of 6 ft (1.8 m) (Sunrise Wind 2023).
- Carmans River crossing would include a maximum length of 2,177 ft (664 m) (COP Section 3.3.2.3, Sunrise Wind 2023) within the Carmans River SCFWH. The HDD trenchless construction methods proposed would avoid direct impacts to surface waters and wetlands and no in-water activities would occur. However, tree removal and other construction-related disturbance would occur during installation.
- An OnCS-DC with a construction disturbance footprint of up to 7 ac (2.8 ha) and an operational footprint of 6 ac (2.4 ha) (Table 3.3.1-4 Maximum Disturbance Areas for the OnCS-DC Site in the COP, Sunrise Wind 2023
- May through June are the months in which seabeach amaranth and sandplain gerardia are monitored for germination and the plants may persist through early November. Construction outside of this window would have fewer impacts than during the growing season.

Variances in these parameters would not result in impacts any greater than those for the Proposed Action, because these design parameters represent the maximum construction footprint for onshore

facilities. Parameters that may change and affect the magnitude of the impact include the transmission route itself, the location of splicing vaults along the transmission route, changes in the footprint of the OnCS-DC, and the location of the HDD stringing area.

Variances in offshore design parameters would not alter the level of impact to coastal habitats and fauna because the offshore parameters would have no effect on these onshore resources.

3.9.5 Impacts of Alternative B - Proposed Action on Coastal Habitat and Fauna

The GAA for impacts to coastal habitats and fauna is limited to proposed onshore facilities, from landfall of the transmission cable at Smith Point County Park to the Union Street converter station and to the existing electrical grid at the Holbrook Substation on the Long Island mainland (see Figure D-6 in Appendix D).

Primary IPFs relevant to coastal habitats and fauna in the GAA are listed in Table G-8 of Appendix G. Areal extent of impacts to coastal habitats from onshore facilities construction and operation and maintenance are provided in Table 3.9-4.

Table 3.9-4. Acres of Significant Coastal Fish and Wildlife Habitats, New York Natural Heritage Program Natural Communities, and Critical Environmental Areas

Transmission Corridor Width*	Total Area		SCFWH Area		NYNHP Significant Natural Communities		CEA		Total Impacts to Designated Habitats		Remaining Other Land Uses	
	ac	ha	ac	ha	ac	ha	ac	ha	ac	ha	ac	ha
30 ft total	102.7	41.6	31.0	12.5	8.9	3.6	12.6	5.1	39.3	15.9	63.4	25.7

* Includes 29.57 ac (0.048 km^2) landfall/ICW work areas, 7.18 ac (0.029 km^2) Union Street converter station footprint, 6.02 ac (0.024 km^2) Holbrook substation, 0.01 ac in the Carmans River Significant Coastal Fish and Wildlife Habitats (SCFWH) and 2.07 ac (0.008 km^2) splicing vaults.

Sources: NYSDEC 2020, Suffolk County Department of Economic Development and Planning 2016, New York Natural Heritage Program Significant Natural Communities 2021, Suffolk County Department of Economic Development and Planning 2021, NYSDOS 2013.

CEA = Critical Environmental Area; SCFWH = Significant Coastal Fish and Wildlife Habitats; NYNHP = New York Natural Heritage Program; ac = acre; ha = hectare

3.9.5.1 Construction and Installation

Anchoring, cable emplacement, land disturbance, presence of structures, and traffic are the primary IPFs relevant to coastal habitats and fauna as a result of construction and installation activities.

3.9.5.1.1 Onshore Activities and Facilities

The potential impacts to coastal habitats from the construction and installation phases of the Proposed Action are summarized in the following sections for each relevant IPF. Impacts to these resources from offshore wind project in general are addressed under the No Action Alternative (Section 3.9.3).

Impacts to coastal habitats would be associated primarily with land disturbance during construction activities. The Proposed Action would disturb and/or alter habitats during construction and operations and disturbance may last the duration of construction in some places, but habitat would recover without the need for mitigation or restoration in most cases. Although local mortality may occur, population-level impacts to coastal habitats and fauna are not expected due to avoidance and minimization and the relatively small GAA being impacted. Overall impacts to coastal habitats and fauna would be expected to be negligible to minor as a result of the Proposed Action, described below for each relevant IPF.

Anchoring: Anchoring along the shoreline during transmission cable landfall activities would have short-term and negligible impacts to coastal habitats such as seagrass beds and hard-bottom habitats due to the short-term nature of these impacts and the anticipated recovery.

A temporary landing structure, connecting ramp, and stabilizing spuds used for materials and equipment transport adjacent are anticipated, as described in Section 3.9.4, above. Historical data were also presented above.

An additional SAV survey was conducted in the area of the temporary landing at Smith Point County Park by Cornell Cooperative Extension (CCE) of Suffolk County on October 12, 2022. SAV surveys were made using underwater video and a GPS-enabled Seaviewer drop camera along pre-established east-west and north-south transect lines covering the proposed temporary landing site (detailed in the 2023 EFH Assessment). No SAV-forming patches or meadows were observed during the survey. However, eelgrass (*Zostera marina*) was identified at six different locations in the northeastern area of the proposed temporary landing site. Four of the SAV observations were single eelgrass shoots emerging from a dense mat of algae and two SAV observations were multiple shoots of eelgrass (less than six shoots per site) that also emerged from an algal mat on the sediment surface. Due to the small number of shoots observed at both locations, these plants are not part of a larger eelgrass patch at the site, but rather they likely arose from seed that had been deposited by drifting eelgrass flower shoots. Results from the video transects indicate no significant populations of eelgrass in the proposed temporary landing site at Smith Point County Park. Most (four of six observations) of the observed eelgrass occurred as single, unrooted shoots that were likely the result of drifting/rafted eelgrass flower shoots.

The likelihood of impacts to intertidal and subtidal vegetated habitats would be considered very low given that the proposed temporary landing structure would be positioned to avoid and minimize impacts to these sensitive habitats to the extent practicable. The temporary landing structure may need to remain in place year round but the use would be limited to fall and spring. The temporary landing structure may be used during two construction periods since the landfall HDD, ICW HDD, and SRWEC pull-in may occur in different years.

Overall, impacts to coastal habitats due to anchoring associated with the temporary landing structure are expected to be short-term and negligible. Cumulative impacts to coastal habitat and fauna from anchoring would be negligible because short term impacts by nature are not cumulative.

Cable emplacement: Land disturbance from cable emplacement, trenching, HDD, traffic, structures, and other activities would be localized and short-term and no greater that that described for land disturbance and other activities required for the installation. Cables buried deeply enough that the surface protection would not be needed would have no impact on coastal habitats. The total length of the transmission cable corridor for the onshore facilities is approximately 89,959 ft (27,420 m) and less than 1 percent (385 ft; 117 m) of the corridor is outside of existing ROWs or utility clearances. The HDD stringing area would require an additional estimated 3,316 ft (1,010.7 m) of beach outside of existing ROWs and developed areas and activities in this area would disturb vegetation and fauna for the duration of Project construction. HDD, use of previously developed rights-of-way (ROW), and re-rerouting of transmission lines would minimize impacts to natural resources that may occur due to open cut trenching to the maximum extent practicable. The selection of open trench or HDD is a result of geotechnical, engineering, and space requirements, as well as the environmental benefits of one method over the other. Neither HDD nor open cut trenching is feasible or appropriate in all situations. As described above, less than 1 percent (385 ft; 117 m) of the corridor is outside of existing ROWs or utility clearances and open trenching and burial of transmission cable would result in little to no impacts to resources in these areas. Trenchless cable crossings (i.e., HDD and jack-piping) would be used to avoid sensitive environmental areas such as the ICW, Carmans River, Central Pine Barrens Core Preservation Area, and/or other obstructions (e.g., LIRR) (Table 3.3.2-5 of the *Onshore Transmission Cable and Onshore Interconnection Cable Crossing* of the COP [Sunrise Wind 2023]). Where the onshore transmission cable is proposed to cross through the Central Pine Barrens Compatible Growth Area proximate to Victory Avenue, the cable would be trenched within the developed highway ROW.

HDD is used to install cables beneath environmentally sensitive areas, such as shoreline habitats and wetlands, where surface disturbance must be minimized beyond what can be done with other methods. Limitations to using HDD include primarily the risk of inadvertent returns of drilling fluids, and also extended installation duration and a large footprint for stringing and installation. In-water HDD would require multiple seasons to complete because of the time required to install cables via HDD (compared to short-term trenching), resulting in longer term impacts compared to short-term impacts of trenching. HDD stringing along the beach at landfall requires additional space and time and therefore has time of year restrictions to avoid impacts to birds, for example. HDD requires a large footprint of already or previously developed area sufficient for the HDD layout during construction and requires use of much more land on either side of a crossing for a significantly longer duration, resulting in substantial noise and visual impacts and impacts to resources over multiple seasons, and has limitations to the distance over which cable can be pulled. For example, the HDD exit pit, located offshore beyond the Fire Island National Seashore boundary, would disturb up to 61.8 ac (25 ha) of soft-bottom benthic habitat (Sunrise Wind 2023), to be reclaimed after cable installation.

Cable emplacement relevant to coastal habitat and fauna impacts, siting and space requirements for onshore connections to telecommunications networks or from offshore wind energy structures to the power distribution grid represent the most significant potential impact on coastal habitat that requires consideration in offshore wind energy development (BOEM 2019). Cumulative impacts are anticipated to be negligible to minor, consistent with BOEM's *NEPA Documentation for impact-producing Factors in the Offshore Wind Cumulative Impacts Scenario on the North Atlantic Outer Continental Shelf* (BOEM 2019)

and with consideration for localized information not included in the earlier document, e.g., location of Carmans River, Fire Island, and other sensitive habitats in the Project Area.

Land disturbance: Land disturbance is expected to account for the greatest amount of impact to coastal habitats and fauna when compared to other IPFs. Land disturbance would result from construction and installation of transmission cables and associated infrastructure and an OnCS-DC construction. Habitats disturbed during trenching and cable installation would be reseeded with native vegetation where practicable. A summary of the areal extent of land disturbances associated with onshore facilities construction and O&M to significant and critical natural communities are described in Table 4.4.1-5 and mapped in Figure 4.4.1-5 of the COP (Sunrise Wind 2023). Primary IPFs relevant to coastal habitats and fauna in the GAA are listed in Table G-8 of Appendix G. Areal extent of impacts to coastal habitats from onshore facilities construction and operation and maintenance are provided in Table 3.9-4.

The proposed transmission cable corridor and onshore facilities construction footprint includes approximately 102.7 ac (0.4 km^2) along and associated with the 30 ft (9.1 m) disturbance area, inclusive of the 30 ft (9.1 m) disturbance corridor, landfall/ICW work areas, HDD stringing area, and splicing vaults. Significant and critical natural communities intercepted include SCFWH and NYNHP Significant Natural Communities; Central Pine Barrens and Carmans River are entirely within the CEA; all other areas overlap substantially. These areas make up 38.3 percent (39.3 ac; 0.16 km^2) of the onshore facilities footprint associated with the 30 ft (9.1 m) disturbance corridor but are located almost exclusively along existing transportation corridors and associated ROWs and utilities clearances. The remaining area (62 percent of the footprint) is primarily recreation and open space and utilities (see Section 3.18, *Land Use and Coastal Infrastructure,* for greater detail on these land uses).

The landfall/ICW work areas are mapped in Figure 3.3.3-3 of the COP (Sunrise Wind 2023). Landfall activities would include HDD stringing on the beach and the use of a drill rig and sheetpiles in the Landfall Work Areas to anchor the onshore drill rig drilling activities (Figure 3.3.3-4 of the COP and detailed in the Project's EM&CP). Where the offshore export cable is proposed to make landfall (i.e., above the MHWL) to be joined with the onshore transmission cable at the transition joint bays, the proposed cable route would intercept maritime beach, a rare and significant coastal community. Impacts to habitats proximate to the landfall/ICW work areas would be avoided by using HDD technology to bury the cable beneath the beach and dune habitats and under the ICW in Great South Bay at Smith Point. Post construction, all work areas would be graded and/or backfilled and returned to pre-construction conditions. Because HDD conduit stringing on the beach would result in the loss of any vegetation it intercepts, there is potential for disturbance of seabeach amaranth if it is present.

Along most of the transmission route, localized adverse impacts to habitats would occur due to trenching, vegetation removal, soil compaction, surface water runoff or pooling, and potential inadvertent burial of vegetation and fauna during construction in ROW and locations where the transmission cable installation changes between trenching and HDD. However, less than 1 percent of the onshore route would be outside existing ROWs, as described in Section 3.9.5.1.1. With few exceptions, trenching and burial of transmission cable would be limited to previously disturbed areas, such as transportation ROWs. Trenchless cable crossings (i.e., HDD and jack-piping) would be used to avoid sensitive environmental areas such as the ICW, Carmans River, Central Pine Barrens Core Preservation

Area, and/or other obstructions (e.g., LIRR), as described in COP Table 3.3.2-5 (Sunrise Wind 2023). No in-water activities would occur at the Carmans River crossing. For installations outside of roadways, such as greenbelt areas, final restoration would typically involve backfilling to the original grade elevation and hydroseeding to prevent soil erosion. Where the onshore transmission cable is proposed to cross through the Central Pine Barrens Compatible Growth Area proximate to Victory Avenue, the cable would be trenched within the developed highway ROW.

The Union Avenue OnCS-DC location is a developed industrial/commercial land use site with linear forest features along the parcel boundaries and would be cleared for construction. Negligible impacts to coastal habitats are anticipated from areas disturbed by the OnCS-DC. Construction of the transmission cable and interconnection facility would provide opportunities for the introduction and establishment of invasive species that would subsequently pose a risk to native vegetation and fauna. In ROW areas, impacts would be short-term and negligible given the areas are already disturbed. In undisturbed habitats, the potential risk is much higher. An Invasive Species Management Plan would be implemented to avoid and manage the introduction and spread of invasive plant species that would likely have negative impacts on native plants and coastal habitat.

Time-of-year restrictions for certain work activities (e.g., HDD conduit stringing and tree removal) would be employed to the extent practicable to avoid or minimize direct impacts to coastal habitat and RTE species, including seabeach amaranth, during construction of the landfall and onshore facilities. Work that would occur outside of these time-of-year restriction periods would be first coordinated with state and federal agencies to develop construction monitoring and impact minimization plans or mitigation plans, as appropriate. Impacts to sea turtles and shore birds are presented in Sections 3.8 and 3.9, respectively.

Construction activities may contribute to erosion and sedimentation during construction. Where appropriate, short-term erosion controls would be installed and maintained until the work areas are restored and stabilized. An OSRP, SWPPP, and SPCC Plan would be implemented to avoid and minimize impacts to sensitive environmental resources. Disturbed habitats are expected to return to their previous condition following construction completion without further restoration. Displaced mobile wildlife would repopulate former habitats once construction is complete and the habitat would recover to pre-construction conditions. Since construction would predominately occur in already developed areas where wildlife is habituated to human activity regardless of the cable route chosen, impacts of land disturbance would be short-term and negligible to minor because very little of the construction along the cable transmission corridor would occur in undisturbed areas and complete recovery is anticipated following Project completion. Cumulative impacts to coastal habitats and fauna from land disturbance would range from negligible to minor due primarily to the localized and short-term nature of these impacts.

Presence of structures: Presence of structures relevant to coastal habitats and fauna include onshore transmission cables and associated facilities along the proposed transmission route; the presence of these structures is expected to convert existing habitats to hard-top and/or impervious surfaces for cable protection and facilities such as the converter station (cable installation is addressed above), albeit relatively small areas of land. The OnCS-DC would be constructed in a compatible area of industrial or

commercial land use and would therefore have negligible impacts on coastal habitats and fauna. Similarly, cumulative impacts to coastal habitats and fauna from these structures would be negligible.

Traffic: Traffic from onshore vehicles may impact coastal habitats and fauna via physical disturbance of habitats and/or collisions. Onshore vehicle traffic detours during construction of onshore facilities may increase the number of vehicles along more sensitive alternative routes. Increases in already common pedestrian and vehicle disturbance at Smith Point County Park would result in further disturbance of maritime dune and grassland habitats and could impact the federally threatened seabeach amaranth. Traffic delays may cause travelers to detour through sensitive areas such as the Wertheim NWR where coastal habitats and vegetation would be disturbed by increased traffic noise, debris from road and vehicles, and potential collisions with wildlife or off-road detours that damage vegetation may occur but would be rare for wildlife due to avoidance of construction noise and activity. Species with limited mobility, especially herpetofauna, would be more vulnerable to this impact, resulting in minor, short-term, adverse impacts to some species. Additional impacts from noise and dust would be short-term and negligible to minor. Consequently, cumulative impacts to coastal habitats and fauna would be negligible to minor.

3.9.5.1.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna from the Proposed Action would be limited to onshore activities and facilities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.5.2 Operations and Maintenance

3.9.5.2.1 Onshore Activities and Facilities

O&M would be limited to regular and intermittent maintenance to onshore transmission cables and the OnCS-DC. Regular O&M activities would not result in additional or further adverse impacts to coastal habitat or fauna habitat. However, when cable inspection or repairs require excavation, resulting in land disturbance, negligible, short-term, and localized adverse impacts to coastal habitats and fauna would be expected. Light resulting from structures and vessels would lead to negligible impacts, if any, on coastal habitats and fauna because of the distance from the coastal habitats and fauna to the offshore facilities. Impacts to coastal habitats and fauna from conceptual decommissioning would be no greater than for construction impacts. The total estimated footprint of onshore facilities is an estimated 102.7 ac (0.42 km^2) for the 30 ft wide (9.14 m) construction footprint, inclusive of the 60 ft (18.3-m) cable transmission, cable corridor, work areas, HDD stringing area, and splicing vaults. Significant and critical natural communities (i.e., SCFWH, significant natural communities, CEAs, and Central Pine Barrens) account for 38 percent (39.3 ac; 0.16 km^2) of the total construction area associated with the 30 ft (18.3-m) disturbance corridor. The remaining area (62 percent of the footprint) is primarily recreation and open space and utilities (see Section 3.18, *Land Use and Coastal Infrastructure,* for greater detail on these land uses).

Overall, the Proposed Action would result in negligible to minor impacts to coastal habitat loss and negligible to minor impacts on coastal fauna due to individual mortality and short-term displacement. No population impacts to coastal fauna would be expected from operation and maintenance activities.

O&M that includes an Invasive Species Management Plan or monitoring would be a benefit to coastal habitats and fauna and provide needed data with respect to potential impacts of onshore transmission cables to coastal habitats and fauna.

3.9.5.2.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna from the Proposed Action would be limited to onshore activities and facilities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.5.3 Conceptual Decommissioning

3.9.5.3.1 Onshore Activities and Facilities

Impacts to coastal habitats and fauna from conceptual decommissioning would be similar to construction impacts described for the Proposed Action. Overall, the conceptual decommissioning would have negligible to minor amounts of coastal habitat loss and negligible to minor impacts on fauna due to mortality and short-term displacement.

3.9.5.3.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna from the Proposed Action would be limited to onshore activities and facilities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.5.4 Cumulative Impacts of the Proposed Action

The cumulative impacts analysis of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to onshore cable installation, converter station construction, O&M along cable corridors, and decommissioning of the Project, would contribute to impacts on coastal habitats and fauna through the primary IPFs of anchoring, land disturbance, cable installation and maintenance, presence of structures, and traffic.

Cumulative impacts of offshore wind components are not expected to have more than negligible to minor impacts on coastal habitats and fauna. Onshore components have the potential to result in disturbance and short-term or permanent loss of onshore habitat and individual fauna if onshore substations are constructed in sensitive areas. Onshore cable installation and maintenance would result in short-term loss of habitat and displacement of fauna. These short-term disturbances for construction and cable installation would not be expected to have population-level impacts within the GAA.

3.9.5.5 Impacts of Alternative B on ESA-Listed Species

Two federally listed plant species (endangered sandplain gerardia and threatened seabeach amaranth) would be potentially impacted by construction of Proposed Action. The proposed landfall/ICW work area on Fire Island north of the parking area includes maritime shrubland habitat and maritime grassland species associated with the federally endangered sandplain gerardia. Maritime beach community is habitat to federally threatened seabeach amaranth and is in the vicinity of the landfall/ICW work area. However, the maritime beach community is used extensively for recreation and impacts from pedestrian and vehicle traffic substantially limit the likelihood of seabeach amaranth occurrences. Notably, the federally threatened seabeach amaranth is considered more vulnerable to non-climate stressors such as coastal development and invasive species rather than climate change (Ricci et al. 2020).

Any potential habitat impacts to seabeach amaranth are the same as those addressed for the piping plover (see Section 3.8.1.1). Coordination with USFWS during the permitting phase of the Project would occur to determine potential effects of the Project on these species. If needed, mitigation actions would be developed for monitoring and protecting the species. To minimize the risk of Project activities incidentally damaging or killing plants, conservation measures for any Project activities proposed for any beach or dune during the growing season of May 15 through November 30 would be implemented. Conclusions presented in this section include consideration of the Project's mitigation and monitoring measures, including those for seabeach amaranth (Appendix H).

No federally listed animals are reported as occurring in in the GAA for coastal habitats and fauna that are not addressed in Section 3.6 *Bats* or 3.8 *Birds*. Activities at the Landfall Work Area proximate to the sand beach habitat on Fire Island would be confined to existing developed areas to avoid and minimize potential impacts to the rare hairy-necked tiger beetle. If conducted on the beach, HDD cable duct stringing, however, may result in the short-term disturbance to any vegetation in the area for approximately 2 to 3 weeks per cable between October and March. Seabeach amaranth may occur on the sandy beach and its presence has been documented approximately 1 mile away. Activities affecting seabeach amaranth are the same as those described for plovers under 3.8 *Birds* and protections would be similar. If construction were to occur outside time-of-year restrictions for certain activities (e.g., HDD conduit stringing and tree removal), then coordination with state and federal agencies to develop construction monitoring and impact minimization plans or mitigation plans would be undertaken, as appropriate. There is no designated critical habitat designated within the footprint of the Proposed Action. With respect to impacts to ESA-listed species, results of consultation with USFWS pursuant to Section 7 of the ESA can be found in the USFWS Biological Opinion, recommended mitigations from this consultation can be found in Appendix H. Impacts to state-listed species from construction of the Project would be similar to those discussed for other habitats and fauna. There are no federally designated critical habitats in the GAA. Consequently, no impacts to federally listed species or critical habitat would be expected.

3.9.5.6 Conclusions

Impacts of the Proposed Action Alternative

Areas most sensitive to potential impacts of the Proposed Action are associated with the landfall/ICW work area on Fire Island and the mainland, and the Carmans River crossing, and include significant and critical natural areas that would be disturbed during Project construction. The landfall/ICW work areas at Smith Point County Park and Smith Point Marina include paved parking lot and open land used for recreational activities, but HDD stringing activities may occur on the beach, disturbing any vegetation or fauna present, and may affect, but are not likely to adversely affect, the seabeach amaranth. The use of HDD for installation would minimize impacts to onshore habitats and protect wildlife in those habitats. For installations outside of roadways, such as greenbelt areas, final restoration typically involves backfilling to the original grade elevation and hydroseeding to prevent soil erosion. Two federally listed plant species (no federally listed non-avian or non-bat animal species) reportedly occur in or proximate to the work areas. Neither plant was found during site surveys of the area, but appropriate habitat is present proximate to the work area. Coordination with the USFWS regarding protections for these species would be implemented.

The Proposed Action would a result of the loss of individuals and disturbance to habitats for the duration of Project construction but no population-level impacts to fauna and no permanent loss of habitat is expected. The Proposed Action combined with ongoing activities, particularly land development and climate change, result in **moderate** adverse impacts.

Cumulative Impacts of the Proposed Action Alternative

In context of other reasonably foreseeable environmental trends in the area, the contribution of the Proposed Action to the impacts of individual IPFs resulting from ongoing and planned activities would be moderate. Considering all the IPFs together, the contribution of the Proposed Action to the impacts from ongoing and planned activities would result in moderate impacts to wildlife in the GAA. Ongoing and planned activities contributing to impacts on wildlife in the GAA include climate change and habitat impacts.

Considering the combined effects of IPFs on coastal habitats and fauna, the overall cumulative impacts associated with the Proposed Action in combination with future offshore wind activities, ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable planned actions other than offshore wind would be **moderate** adverse. Land disturbance is expected to continue to have the greatest impact on the condition of coastal habitats and fauna in the GAA.

3.9.6 Alternative C-1 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

3.9.6.1 Construction and Installation

3.9.6.1.1 Onshore Activities and Facilities

None of the components included under Alternative C-1 would alter the construction of the proposed onshore facilities as compared to the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C would be the same as those described for the Proposed Action.

3.9.6.1.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-1 would be limited to onshore activities and facilities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.6.2 Operations and Maintenance

3.9.6.2.1 Onshore Activities and Facilities

None of the components under Alternative C-1 would alter the O&M of the proposed onshore facilities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-1 would be the same as those described for the Proposed Action.

3.9.6.2.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-1 would be limited to onshore O&M activities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.6.3 Conceptual Decommissioning

3.9.6.3.1 Onshore Activities and Facilities

None of the components included under Alternative C would alter the decommissioning processes for the proposed onshore activities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-1 would be the same as those described for the Proposed Action.

3.9.6.3.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-1 would be limited to onshore O&M activities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.6.4 Cumulative Impacts of Alternative C-1

Cumulative impacts to coastal habitats and fauna under Alternative C-1 would be the same as those described for the Proposed Action Alternative.

3.9.6.5 Impacts of Alternative C-1 on ESA-Listed Species

None of the components under Alternative C-1 would alter the proposed onshore facilities described for the Proposed Action. Therefore, impacts to ESA-listed species from the reconfigured layout under Alternative C-1 would be the same as those described for the Proposed Action.

3.9.6.6 Conclusions

Impacts of Alternative C-1

None of the components under Alternative C-1 would alter the proposed onshore activities and facilities, O&M, or conceptual decommissioning described for the Proposed Action. Therefore, impacts to coastal habitats and fauna, including ESA-listed species, from the reconfigured layout under Alternative C-1 would be the same as those described for the Proposed Action, **moderate** adverse.

Cumulative Impacts of Alternative C-1

Cumulative impacts to coastal habitats and fauna under Alternative C-1 would be the same as those described for the cumulative Proposed Action impacts, **moderate** adverse

3.9.7 Alternative C-2 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

None of the components included under Alternative C-2 would alter the construction of the proposed onshore facilities as compared to the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-2 would be the same as those described for the Proposed Action.

3.9.7.1 Construction and Installation

3.9.7.1.1 Onshore Activities and Facilities

None of the components under Alternative C-2 would alter the O&M of the proposed onshore facilities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-2 would be the same as those described for the Proposed Action.

3.9.7.1.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-2 would be limited to onshore activities and facilities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.7.2 Operations and Maintenance

3.9.7.2.1 Onshore Activities and Facilities

None of the components under Alternative C-2 would alter the O&M of the proposed onshore facilities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-2 would be the same as those described for the Proposed Action.

3.9.7.2.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-2 would be limited to onshore O&M activities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.7.3 Conceptual Decommissioning

3.9.7.3.1 Onshore Activities and Facilities

None of the components included under Alternative C would alter the decommissioning processes for the proposed onshore activities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-2 would be the same as those described for the Proposed Action.

3.9.7.3.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-2 would be limited to onshore O&M activities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.7.4 Cumulative Impacts of Alternative C-2

Cumulative impacts to coastal habitats and fauna under Alternative C-1 would be the same as those described for the No Action Alternative.

3.9.7.5 Impacts of Alternative C-2 on ESA-Listed Species

None of the components under Alternative C-2 would alter the proposed onshore facilities described for the Proposed Action. Therefore, impacts to ESA-listed species from the reconfigured layout under Alternative C-2 would be the same as those described for the Proposed Action.

3.9.7.6 Conclusions

Impacts of Alternative C-2

None of the components under Alternative C-2 would alter the proposed onshore activities and facilities, O&M, or conceptual decommissioning described for the Proposed Action. Therefore, impacts to coastal habitats and fauna, including ESA-listed species, from the reconfigured layout under Alternative C-2 would be the same as those described for the Proposed Action, **moderate** adverse

Cumulative Impacts of Alternative C-2

Cumulative impacts to coastal habitats and fauna under Alternative C-2 would be the same as those described for the cumulative Proposed Action, moderate adverse

3.9.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

None of the components included under Alternative C-3 would alter the construction of the proposed onshore facilities as compared to the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action.

3.9.8.1 Construction and Installation

3.9.8.1.1 Onshore Activities and Facilities

None of the components under Alternative C-3 would alter the construction and installation of the proposed onshore facilities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action.

3.9.8.1.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-3 would be limited to onshore activities and facilities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.8.2 Operations and Maintenance

3.9.8.2.1 Onshore Activities and Facilities

None of the components under Alternative C-3 would alter the O&M of the proposed onshore facilities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action.

3.9.8.2.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-3 would be limited to onshore O&M activities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.8.3 Conceptual Decommissioning

3.9.8.3.1 Onshore Activities and Facilities

None of the components included under Alternative C-3 would alter the decommissioning processes for the proposed onshore activities described for the Proposed Action. Therefore, impacts to coastal habitats and fauna from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action.

3.9.8.3.2 Offshore Activities and Facilities

Potential impacts to coastal habitats and fauna under Alternative C-3 would be limited to onshore O&M activities. Therefore, impacts from offshore activities and facilities are not presented for this alternative.

3.9.8.4 Cumulative Impacts of Alternative C-3

Cumulative impacts to coastal habitats and fauna under Alternative C-3 would be the same as those described for the No Action Alternative.

3.9.8.5 Impacts of Alternative C-3 on ESA-Listed Species

None of the components under Alternative C-3 would alter the proposed onshore facilities described for the Proposed Action. Therefore, impacts to ESA-listed species from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action.

3.9.8.6 Conclusions

Impacts of Alternative C-3

None of the components under Alternative C-3 would alter the proposed onshore activities and facilities, O&M, or conceptual decommissioning described for the Proposed Action. Therefore, impacts to coastal habitats and fauna, including ESA-listed species, from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action, **moderate** adverse.

Cumulative Impacts of Alternative C-3

Cumulative impacts to coastal habitats and fauna under Alternative C-3 would be the same as those described for the cumulative Proposed Action, **moderate** adverse.

3.9.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall negligible to minor adverse impacts and minor beneficial impacts on coastal habitats and fauna. Table 3.9-5 provides an overall summary of alternative impacts.

Table 3.9-5. Comparison of Alternatives Impacts on Coastal Habitat and Fauna

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: The impacts of ongoing activities, especially land disturbance due to development, would be potentially moderate. The combined impacts of ongoing activities and planned actions other than offshore wind are expected to result in **moderate** adverse impacts on coastal habitats. *Cumulative Impacts of the No Action Alternative:* Considering the combined effects of IPFs on coastal habitats and fauna, the overall impacts associated with future offshore wind activities, combined with ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable planned	*Proposed Action:* Overall adverse impacts to coastal habitats and fauna from the Proposed Action would be **moderate** as a result of the loss of individuals and disturbance to habitats for the duration of Project construction but no population-level impacts to fauna and no permanent loss of habitat is expected. *Cumulative Impacts of the Proposed Action:* The overall impacts associated with the Proposed Action in combination with future offshore wind activities, ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable planned actions other than offshore wind would	*Alternative C-1:* None of the components under Alternative C-1 would alter the proposed onshore activities and facilities, O&M, or conceptual decommissioning described for the Proposed Action. Therefore, adverse impacts to coastal habitats and fauna, including ESA-listed species, from the reconfigured layout under Alternative C-1 would be the same as those described for the Proposed Action, **moderate**. *Cumulative Impacts of Alternative C-1:* Cumulative impacts to coastal habitats and fauna under Alternative C-1 would be the same as those described for the cumulative Proposed Action impacts, **moderate** adverse impacts.	*Alternative C-2:* None of the components under Alternative C-2 would alter the proposed onshore activities and facilities, O&M, or conceptual decommissioning described for the Proposed Action. Therefore, adverse impacts to coastal habitats and fauna, including ESA-listed species, from the reconfigured layout under Alternative C-1 would be the same as those described for the Proposed Action, **moderate**. *Cumulative Impacts of Alternative C-2:* Cumulative impacts to coastal habitats and fauna under Alternative C-2 would be the same as those described for the cumulative Proposed Action impacts, **moderate** adverse impacts.	*Alternative C-3:* None of the components under Alternative C-3 would alter the proposed onshore activities and facilities, O&M, or conceptual decommissioning described for the Proposed Action. Therefore, adverse impacts to coastal habitats and fauna, including ESA-listed species, from the reconfigured layout under Alternative C-3 would be the same as those described for the Proposed Action, **moderate**. *Cumulative Impacts of Alternative C-3:* Cumulative impacts to coastal habitats and fauna under Alternative C-3 would be the same as those described for the cumulative Proposed Action impacts, **moderate** adverse impacts.

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
actions other than offshore wind would be **moderate** adverse cumulative impacts.	be **moderate** adverse cumulative impacts. Land disturbance is expected to continue to have the greatest impact on the condition of coastal habitats and fauna in the geographic area of analysis.			

3.9.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. As a result, BOEM anticipates Alternative C-3b would have negligible to minor impacts on coastal habitats and fauna within the GAA. Overall impacts to coastal habitats and fauna from the Proposed Action would be **moderate** as a result of the loss of individuals and disturbance to habitats for the duration of Project construction but subsequent recovery from most impacts. No population-level impacts to fauna and no permanent loss of habitat are expected.

3.9.11 Proposed Mitigation Measures

No additional measures to mitigate impacts on coastal habitat and fauna have been proposed for analysis.

3.9.11.1 Effect of Measures Incorporated into the Preferred Alternative

Since no mitigation measures have been proposed, impacts levels for the Preferred Alternative would remain as described above in Section 3.9.8.

3.12 Sea Turtles

This section discusses potential impacts on sea turtles from the proposed Project, alternatives, and future offshore wind activities in the GAA (Appendix D, Figure D-9). The sea turtle GAA as described in Appendix D, includes the Scotian Shelf, Northeast Shelf, and Southeast Shelf large marine ecosystems.

3.12.1 Description of the Affected Environment and Future Baseline Conditions

Of the five sea turtle species with occurrence records off the northeastern coast of the United States (DoN 2005), four species are expected to occur in the proposed Project Area (Table 3.12-1). These species may occur near the onshore facilities (SRWEC landfall location at Smith Point on Long Island, New York) and the in-water areas which range from state waters (SRWEC-NYS from the shoreline to a maximum depth of 29 m) to federal waters (SRWEC-OCS with maximum depth of 68 m and SRWF which ranges from 35 to 62 m in depth) (COP, Appendix G1; Sunrise Wind 2022). Population estimates for sea turtles are difficult as they are wide-ranging and long-lived, and necessary survey methods vary depending on the species (NMFS and USFWS 2015). Expected occurrence in these areas is summarized in Table 3.12-1 and is based on known habitat associations, confirmed sightings and strandings, and the potential for occurrence based on these factors regardless of how frequent that occurrence may be. Ongoing threats to these species in this region include, but are not limited to, entanglement in fishing gear, fisheries bycatch, marine debris ingestion or entanglement, vessel strike, nesting beach impacts, climate change, noise pollution, marine and coastal construction activities, vessel traffic, seismic surveys, sonar and other military activities, beach cleaning, beach nourishment, shoreline armoring, recreational beach equipment, beach driving, artificial lighting, and nest relocation (Hamann et al. 2010; Lutcavage et al. 1997; NMFS et al. 2011a, 2011b; NMFS and USFWS 2008, 2013a, 2013b; Osgood 2008; TEWG 2007; Witherington and Martin 2003).

Brief descriptions of the regional and proposed Project Area occurrence of the sea turtle species expected to occur in the proposed Project Area are provided below. These species are all protected species under the ESA and include the green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), and Kemp's ridley sea turtle (*Lepidochelys kempii*). There is no critical habitat in or near the proposed Project Area. Although occasional occurrences are possible, hawksbill sea turtles (*Eretmochelys imbricata*), which are also protected under the ESA, are not expected to occur in the proposed Project Area and are not considered further in this Final EIS. This species primarily occurs in warmer southern waters associated with coral reef habitats (NMFS and USFWS 1993; Diez et al. 2003) and is exceedingly rare north of Florida (GARFO 2021b; Keinath et al. 1991; Lee and Palmer 1981; Parker 1995; Plotkin 1995; USFWS 2001). Kenney and Vigness-Raposa's (2010) assessment of sea turtles present in southern New England, the hawksbill turtle is considered a hypothetical species in this region based on the relatively few stranding records in Massachusetts and New York (Lazell 1980; Morreale et al. 1992; Prescott 2000; Zarriello and Steadman 1987). In addition, no hawksbill turtles have been sighted off the northeastern United States during recent AMAPPS surveys (e.g., NEFSC and SEFSC 2018, 2020, 2021), Rhode Island/Massachusetts WEA surveys (Kraus et al. 2016; O'Brien et al. 2021a; Quintana et al. 2019; Stone et al. 2017), or Project-specific geophysical surveys (Gardline 2021a, 2021b; Smultea Sciences 2020a, 2020b).

Leatherback sea turtle: The leatherback sea turtle is the most globally distributed sea turtle species, ranging broadly from tropical and subtropical to temperate regions of the world's oceans (NMFS and USFWS 1992). Leatherbacks are a pelagic species but are commonly observed in coastal waters along the United States continental shelf (NMFS and USFWS 1992). In the northeastern United States, leatherbacks have a regular, seasonal occurrence. In the late winter and early spring, leatherbacks are distributed primarily in tropical latitudes (Stewart and Johnson 2006); survey data confirm that around this time of year, individuals begin to move north along the North American Atlantic coast. By February and March, the majority of leatherbacks found in Atlantic WOTUS are distributed off northeastern Florida. This movement continues through April and May when leatherbacks begin to occur in large numbers off the coasts of Georgia and North and South Carolina (NMFS 1995, 2000). Leatherbacks become more numerous off the Mid-Atlantic and southern New England coasts in late spring and early summer, and by late summer and early fall, they may be found in the waters off eastern Canada (CETAP 1982; Dodge et al. 2014; Shoop and Kenney 1992; Thompson et al. 2001).

Table 3.12-1. Sea Turtles Expected to Occur in the Proposed Project Area

Species[1]	DPS	ESA Status[2]	Regional Nester Abundance[3]	SRWF Density[4]				Strandings[5]	Expected to Occur in SRWF	Expected to Occur in SRWEC-OCS	Expected to Occur in SRWEC-NYS	Expected to Occur in Onshore Facilities[6]
				Winter	Spring	Summer	Fall					
Leatherback sea turtle (*Dermochelys coriacea*)	Northwest Atlantic	E	20,659 (Northwest Atlantic) (NMFS and USFWS 2020)	0.0034	0.0039	0.2986	0.4431	231	Yes	Yes	Yes	No
Loggerhead sea turtle (*Caretta caretta*)	Northwest Atlantic	T	38,334 (Northwest Atlantic) (Richards et al. 2011)	0.0015	0.0015	0.0147	0.0171	250	Yes	Yes	Yes	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	N/A	E	4,395 (Gulf of Mexico) (NMFS and USFWS 2015)	0.0000	0.0000	0.0053	0.0034	174	Yes	Yes	Yes	Yes
Green sea turtle (*Chelonia mydas*)	North Atlantic	T	167,424 (North Atlantic DPS) (NMFS and USFWS 2016)	0.0000	0.0000	0.0461	0.0264	72	Yes	Yes	Yes	Yes

Source: See references cited within the table and in the notes below.

Notes: DPS = distinct population segment

[1] Taxonomy follows Pritchard (1997).

[2] ESA status: E = endangered, T = threatened

[3] Abundance estimates of nesting females are provided and use best available data.

[4] The seasonal density estimates provided in this table are corrected for perception and availability bias and were derived from the models developed by the U.S. Naval Undersea Warfare Center (NUWC). These models were released in July 2023 (NUWC/EC 2023; Sparks and DiMatteo 2023). Seasons are defined as follows: spring (March through May), summer (June through August), fall (September through November), and winter (December through February). The estimates include OCS Lease Area 0487 with a 10-km (6.2 mi) buffer.

[5] A stranding is defined as "a sea turtle that is either found dead or is alive but is unable to go about its normal behavior due to any injury, illness, or other problem" and is "found washed ashore or floating in the water". Data reflects reports from 2017 to 2021 from New York to Massachusetts (NMFS STSSN 2022).

[6] Occurrence in onshore facilities is based on nesting potential on Long Island. Leatherback nesting in the U.S. is mainly on the Atlantic coast of Florida (Stewart and Johnson 2006) with sporadic nesting in Georgia, South Carolina, and North Carolina (Rabon et al. 2003). Although hardshell turtle nesting beaches are primarily south of NY, loggerhead, green, and Kemp's ridley turtles are known to nest in the Mid-Atlantic, and a Kemp's ridley recently nested on Long Island (Rafferty et al. 2019). A sea turtle nesting response plan is being developed for New York (Bonacci-Sullivan 2018).

Peak leatherback occurrence in the proposed Project Area is expected during the summer and fall although this species may occur in the region year-round (Table 3.12-1). During recent aerial surveys in the NYB, leatherbacks were sighted during all seasons except winter, and most sightings were during summer and fall and were in nearshore and offshore waters (NYSERDA 2020; Tetra Tech and LGL 2019; 2020). AMAPPS surveys conducted from 2010 through 2013 routinely documented leatherbacks in New England waters, including the Rhode Island/Massachusetts WEAs (Palka et al. 2017a, 2017b). The STSSN reported 89 offshore and 142 inshore leatherback sea turtle strandings between 2017 and 2021 from New York to Massachusetts (NMFS STSSN 2022). During the NLPSC surveys in the Rhode Island/Massachusetts WEAs, leatherbacks were recorded during spring, summer, and fall with a strong peak in August (Kraus et al. 2016; O'Brien et al. 2021a, 2021b; Quintana et al. 2019; Stone et al. 2017). Sightings were documented close to shore (within 10 nm) (O'Brien et al. 2021a). During Project-specific geophysical surveys, leatherbacks were sighted in or near the proposed Project Area during June, July, August, and October (Gardline 2021a; Smultea Sciences 2020a).

Loggerhead sea turtle: Foraging loggerhead sea turtles range widely and have been observed along the entire Atlantic coast as far north as Canada (Brazner and McMillan 2008; Ceriani et al. 2014; Shoop and Kenney 1992). In southern New England, loggerhead sea turtles can be found seasonally, primarily during the summer and fall but are typically absent during the winter (Kenney and Vigness-Raposa 2010; Shoop and Kenney 1992) as distribution is dictated primarily by sea surface temperatures (SSTs). Loggerheads are associated with SSTs between 55.5°F and 82.4°F (13°C and 28°C) (Mrosovsky 1980); they tend to become lethargic in SSTs below 59°F (15°C) and may become incapacitated ("cold-stunned") at temperatures below 50°F (10°C) (Mrosovsky 1980; Schwartz 1978). Loggerheads occur north of Cape Hatteras primarily in late spring through early fall (May and October) with a peak occurrence in June; however, sightings are recorded in Mid-Atlantic and northeast waters throughout the year (CETAP 1982; DoN 2008a, 2008b; Lutcavage and Musick 1985; Shoop and Kenney 1992). During the summer, loggerheads may be found regularly in shelf waters from Delaware Bay to Hudson Canyon, including Long Island Sound and Cape Cod Bay (Burke et al. 1991; Prescott 2000; Shoop and Kenney 1992; University of Delaware Sea Grant 2000). As SSTs decrease in the winter, most individuals move south of Cape Hatteras to overwinter (Epperly et al. 1995; Hawkes et al. 2011; Mitchell et al. 2002). From November to April, loggerheads are primarily found off the coast of southern North Carolina in the South Atlantic Bight (Griffin et al. 2013); however, stranding and sighting data indicate that not all loggerheads leave Mid-Atlantic and New England waters during the winter (Burke et al. 1991).

Loggerhead turtles may occur year-round in the proposed Project Area; peak occurrence is expected to be during summer and fall (Table 3.12-1). Loggerheads are the most commonly sighted sea turtles on the shelf waters from New Jersey to Nova Scotia, Canada. During AMAPPS surveys between December 2014 and March 2015, 280 individuals were recorded in this region (Palka et al. 2017a, 2017b). Throughout the NYB, loggerheads are sighted year-round with fewer sightings recorded during the winter (NYSERDA 2020; Tetra Tech and LGL 2020). Large concentrations of loggerheads are regularly observed south and east of Long Island near the Rhode Island/Massachusetts WEAs (NEFSC and SEFSC 2018). During the NLPSC surveys, loggerhead turtles were sighted within the Rhode Island/Massachusetts WEAs during spring, summer, and fall with the greatest number of observations in summer and fall (Kraus et al. 2016; O'Brien et al. 2021a, 2021b; Quintana et al. 2019; Stone et al. 2017). During Project-specific geophysical surveys, loggerheads were sighted in or near the proposed Project Area during June, July, August, and

September (Smultea Sciences 2020a). The STSSN reported 78 offshore and 172 inshore loggerhead sea turtle strandings between 2017 and 2021 from New York to Massachusetts, the highest number among all turtle species reported (NMFS STSSN 2022). In NYS waters, the New York Marine Rescue Center (NYMRC) documented 816 strandings of loggerhead sea turtles from 1980 to 2018 (New York Marine Rescue Center 2022). Winton et al. (2018) estimated densities of tagged turtles using data from 271 satellite tags deployed on loggerhead sea turtles between 2004 and 2016 and found that tagged loggerheads primarily occupied the continental shelf from Long Island, New York, south to Florida, but relative densities in the Rhode Island/Massachusetts WEAs increased between July and September. Collectively, available information indicates that loggerhead sea turtles are expected to occur commonly as adults, subadults, and juveniles from the late spring through fall, with the highest probability of occurrence from July through September (Winton et al. 2018).

Kemp's ridley sea turtle: Kemp's ridley sea turtles inhabit open ocean and *Sargassum* habitats of the North Atlantic Ocean as post-hatchlings and small juveniles (Manzella et al. 1991; Witherington et al. 2012). The species is primarily associated with habitats on the continental shelf with preferred habitats consisting of sheltered areas along the coastline, including estuaries, lagoons, and bays (Burke et al. 1994; Landry and Costa 1999; Lutcavage and Musick 1985; Seney and Musick 2005) and nearshore waters less than 120 ft (37 m) deep although they can be found in deeper offshore waters (Shaver and Rubio 2008; Shaver et al. 2005). Their most suitable habitats are less than 33-ft-(10 m) deep with SSTs between 72°F and 90°F (22°C and 32°C) (Coyne et al. 2000). Seagrass beds, mud bottom, and live bottom are important developmental habitats (Schmid and Barichivich 2006). Large juveniles and adults move to benthic, nearshore feeding grounds along the Atlantic and Gulf coasts of the United States (Morreale and Standora 2005). Some juveniles may migrate as far north as New York and New England, arriving in these areas around June and leaving to travel south in early October (Morreale and Standora 2005). Nesting occurs primarily on a single beach at Rancho Nuevo on the eastern coast of Mexico (USFWS and NMFS 1992) with a few additional nests in Texas, Florida, South Carolina, and North Carolina (Foote and Mueller 2002; Godfrey 1996; Meylan et al. 1990; Weber 1995) and an occasional nest in Virginia (Boettcher 2015) and New York (Rafferty et al. 2019).

Kemp's ridley turtles may occur year-round in the proposed Project Area; occurrence is expected to be lowest during winter and spring (Table 3.12-1). Despite the amount of aerial survey effort conducted in the NYB and southern New England, this small turtle species is extremely difficult to observe via high-altitude surveys, so sightings may often go undetected. During the recent NYB surveys, relatively few Kemp's ridley turtles were sighted compared to other turtle species; sightings were recorded during spring, summer, and fall (NYSERDA 2020; Tetra Tech and LGL 2020). During NLPSC surveys in the Rhode Island/Massachusetts WEAs, Kemp's ridley sightings were during August and September 2012 (Kraus et al. 2016). During Project-specific geophysical surveys, one Kemp's ridley was sighted in the proposed Project Area during July 2020 (Gardline 2021a). The STSSN reported 17 offshore and 157 inshore Kemp's ridley sea turtle strandings between 2017 and 2021 from New York to Massachusetts (NMFS STSSN 2022), and the NYMRC documented strandings of 620 Kemp's ridley sea turtles within NYS waters between 1980 and 2018 (New York Marine Rescue Center 2022). Cold-stunned Kemp's ridley sea turtles are often found stranded on the beaches of Cape Cod (Liu et al. 2019; Wellfleet Bay Wildlife Sanctuary 2018). The first confirmed Kemp's ridley nesting event on Long Island was in July 2018 (Rafferty et al. 2019).

Green sea turtle: Along the east coast of the United States, adult green sea turtles are only occasionally found north of Florida, which is near the northern extent of the green turtle's Atlantic nesting range, although some nests have been documented in Georgia, the North and South Carolina, and Virginia (Boettcher 2015; NMFS and USFWS 1991a; Peterson et al. 1985; Schwartz 1989; USFWS 2005). Juveniles and subadults range as far north as Massachusetts (NMFS and USFWS 1991a) and are occasionally observed in Long Island Sound, Nantucket Sound, and Cape Cod Bay (CETAP 1982; Lazell 1980; Morreale et al. 1992). The STSSN reported four offshore and 68 inshore green sea turtle strandings between 2017 and 2021 from New York to Massachusetts, and green sea turtles are found each year stranded on Cape Cod beaches (NMFS STSSN 2022; Wellfleet Bay Wildlife Sanctuary 2018). Sightings in or near the proposed Project Area are limited. This species may occur in the proposed Project Area in small numbers throughout the year. Peak occurrence is expected during summer and fall (Table 3.12-1). During the recent NYB surveys, one green sea turtle was sighted during spring 2016 (NYSERDA 2020). Kenney and Vigness-Raposa (2010) recorded one confirmed sighting within the Rhode Island/Massachusetts WEAs in 2005. Five green sea turtle sightings were recorded off the Long Island shoreline 10 to 30 mi (16 to 48 km) southwest of the WEAs during AMAPPS aerial surveys conducted from 2010 to 2013 (NEFSC and SEFSC 2018), but none were positively identified during the NLPSC aerial surveys of the Rhode Island/Massachusetts WEAs from October 2011 to October 2020 (Kraus et al. 2013; O'Brien et al. 2021a, 2021b; Quintana et al. 2019).

3.12.2 Impact Level Definitions for Sea Turtles

This Final EIS uses a four-level classification scheme to analyze potential impact levels on sea turtles from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.12-2 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for sea turtles. Table G-11 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to sea turtles.

Table 3.12-2. Definition of Potential Adverse and Beneficial Impact Levels for Sea Turtles

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	Impacts on sea turtles are undetectable or barely measurable, with no consequences to individuals or populations.	Impacts on individual sea turtles and/or their habitat would be beneficial but at the lowest levels of detection and barely measurable.
Minor	Impacts on sea turtles are detectable and measurable but are low intensity, highly localized, and short-term in duration. May include impacts to or loss of individuals, but these impacts would not result in population-level effects.	Impacts on individual sea turtles and/or their habitat are detectable and measurable. The effects are likely to benefit individuals, be localized, and/or be short-term and are unlikely to lead to population-level effects.
Moderate	Impacts on sea turtles are detectable and measurable. These impacts could result in population-level effects, but those effects	Impacts on individual sea turtles and/or their habitat are detectable and measurable. These benefits may affect large areas of habitat, be

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
	would likely be recoverable and would not affect stock or population viability.	long-term, and/or affect a large number of individuals and may lead to a detectable increase in populations but is not expected to improve the overall viability or recovery of affected species or population.
Major	Impacts on sea turtles are significant and extensive, long-term in duration, and could have population-level effects that are not recoverable, even with mitigation.	Impacts on individual sea turtles and/or their habitat are detectable and measurable. These impacts on habitat may be short-term, long-term, or permanent and would promote the viability of the affected species/population and/or increase the affected species/population levels.

3.12.3 Impacts of Alternative A – No Action on Sea Turtles

When analyzing the impacts of the No Action Alternative on sea turtles, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities, on the baseline conditions for sea turtles. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in *Appendix E* (*Planned Activities Scenario*).

3.12.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for sea turtles would continue to follow current regional trends and respond to IPFs introduced by other ongoing offshore wind and non-offshore wind activities.

Important IPFs for sea turtles within the GAA are generally associated with noise and vessel strikes, the presence of structures, and ongoing climate change. Fuel spills and releases of trash and debris have lesser potential impact on sea turtles due to their low probability of occurrence and relatively limited spatial impact. Specific activities other than offshore wind development that may affect sea turtles include commercial fisheries bycatch; marine transportation; military use; oil and gas activities; undersea transmission lines, gas pipelines, and other submarine cables; tidal energy projects; dredging and port improvement; marine minerals use and ocean-dredged material disposal, and global climate change (see Appendix E for a complete description of ongoing and planned activities). Also, the impacts of land use and coastal development affect sea turtles primarily through habitat loss from development near sea turtle nesting areas. These activities could result in short-term or permanent displacement and injury or mortality to individual sea turtles.

Global climate change is an ongoing potential risk to sea turtles, although the associated impact mechanisms are complex, not fully understood, and difficult to predict with certainty, especially considering potential interactions with other IPFs. Possible impacts to sea turtles due to climate change include increased storm severity and frequency; increased erosion and sediment deposition; disease frequency; ocean acidification; and altered habitat, prey availability, ecology, and migration patterns

(Hawkes et al. 2009). The potential implications of these factors and other related environmental changes for sea turtles, and the ways in which they are likely to interact with the effects of regional offshore wind development, are complex and uncertain. Increasing ocean temperatures are already having a quantifiable impact on ecological processes that affect sea turtles (NEFSC and SEFSC 2021). Evidence shows a northward shift in the distribution of certain species based on water temperature (McMahon and Hays 2006; NEFSC and SEFSC 2021), and future warming could result in a higher interaction between sea turtles and offshore wind farms, potentially magnifying the impacts and benefits described above. Over time, climate change, in combination with coastal and offshore development, would alter existing habitats, potentially rendering some areas unsuitable for certain species and more suitable for others. Green, loggerhead, and Kemp's ridley sea turtle populations have generally been increasing over the past few decades, while leatherback sea turtle populations have declined. Leatherback declines are thought to be primarily related to development of nesting habitat, incidental capture from fisheries, entanglement in fishing gear, and vessel strikes (NMFS and USFWS 2020). Therefore, potential climate change could result in population-level impacts on sea turtle species by displacement, impacts on prey species, altered population dynamics, and increased mortality.

Ongoing offshore wind activities within the GAA that contribute to impacts on sea turtles include:

- Continued O&M of the Block Island project (5 WTGs) installed in state waters;
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Fork projects would affect sea turtles through the primary IPFs of noise, presence of structures, and land disturbance. Ongoing offshore wind activities would have the same type of impacts from noise, presence of structures, and land disturbance that are described in detail in the following section for planned offshore wind activities, but the impacts would be of lower intensity.

3.12.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Planned non-offshore wind activities related to submarine cables and pipelines, oil and gas activities, marine minerals extraction, onshore development, and port expansions would contribute to impacts on sea turtles through the primary IPFs of noise, presence of structures, and land disturbance. The construction, O&M, and decommissioning of offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of noise, presence of structures, and land disturbance. These include other offshore wind and renewable energy projects, and potential port improvements to support the development of this industry regionwide (see Appendix E).

This Final EIS expects that future offshore wind activities, exclusive of the Proposed Action, could affect sea turtles through the following primary IPFs: seafloor disturbance, sediment suspension and

deposition, noise, electrical and magnetic fields, accidental releases of contaminants, trash, and debris, traffic, lighting, presence of structures, and port utilization. BOEM (2019c) identifies these important IPFs for sea turtles due to offshore wind activities on the North Atlantic OCS and describes the cause and-effect relationships between renewable energy projects and sea turtles.

Offshore wind activities have the potential to produce impacts from site characterization studies, site assessment data collection activities that involve installation of meteorological towers or buoys, and installation and operation of turbine structures. The IPFs deemed to have impacts on sea turtles are summarized in this section for offshore wind activities without the Proposed Action. This section provides a general description of these mechanisms, recognizing the extent and significance of potential effects on conditions cannot be fully quantified for projects that are in the conceptual or proposal stage and have not been fully designed. Where appropriate, certain potential effects resulting from these future actions can be generally characterized by comparison to effects resulting from the Proposed Action that are likely to be similar in nature and significance. The intent of this section is to provide a general overview of how future activities might influence future environmental conditions. Should any or all of the future activities described in Appendix E proceed, each would be subject to independent NEPA analyses and regulatory approvals, and their environmental effects would be fully considered therein.

Seafloor disturbance: Future offshore wind projects could disturb seabed while installing associated undersea cables. Trenching activities to place transmission cables would create areas of short-term seafloor disturbance. Installation of WTGs, support equipment, scour protection, and other related equipment would result in the long-term alteration of substrates. These structures are likely to alter prey composition for sea turtles by adding hard substrates that would result in a reef effect; however, prey availability is not considered a limiting factor for sea turtles. The area permanently altered by new infrastructure and scour protection would be miniscule in comparison to the area of the WEA and OCS region. short-term impacts would occur over a larger area but would be distributed in time from 2023 to 2030 and are expected to only have short-term, localized impacts. The area of short-term impacts would also be small in comparison to the WEA and OCS region. Alterations to the seafloor are not expected to negatively impact prey resources for sea turtles, and the overall impact to sea turtles is expected to be negligible.

Sediment suspension and deposition: Future offshore wind projects could disturb seabed while installing associated undersea cables, causing an increase in suspended sediment. This disturbance would result in short-term plumes of suspended sediments in the immediate construction areas. Elliott (2017) monitored TSS levels during construction of the BIWF. The observed TSS levels were far lower than levels predicted using the same modeling methods, dissipating to baseline levels less than 50 ft (15.2 m) from the disturbance. Both the modeled TSS effects, which are conservatively high, and the observed TSS effects were short-term and within the range of baseline variability; however, these effects are short-term (lasting only a few tide cycles) due to the low mobility of sediments (primarily sand) in a proposed dredge area (Stantec 2020).

This limited temporal effect over a relatively small area is not expected to interfere with sea turtle foraging success. Data are not available regarding impacts of suspended sediments on adult or juvenile sea turtles although elevated suspended sediments may cause individuals to alter normal movements and behaviors. Sea turtles are expected to avoid the immediate vicinity of sediment plumes; however,

these changes in behavior would be limited in extent, short-term in duration, and likely too small to be detected (NOAA 2022).

Increases in suspended sediments may also alter the behavior or prey species for sea turtles. Seafloor disturbance during construction of future offshore wind projects may affect foraging success for some prey species and result in short-term behavior disturbances for individual prey species. Because these disturbances are be localized in extent, limited in magnitude, and short-term, only short-term, limited impacts to fish and invertebrates are expected from suspended sediments, and no population-level impacts are expected for any prey species. Therefore, secondary effects from future wind activities to sea turtles from prey availability are expected to have minor, short-term adverse impacts.

Noise: Under the No Action Alternative, human activities would continue to generate underwater noise with the potential to affect sea turtles. Existing and future sources of anthropogenic underwater noise include commercial, government and military, research, and recreational vessel activity, and the development and operation of other wind energy projects on the OCS. Several offshore wind project construction periods would overlap from 2022 to 2030 (see Appendix E). Construction from these projects, most notably pile driving, would create airborne and underwater noise with minor potential to affect sea turtles. Underwater noise could result in physiological and/or behavioral effects, including potential auditory injuries, short-term disturbance or displacement, and possible startle or stress responses. Injury and behavioral disturbance thresholds for sea turtles are provided in Table 3.12-3.

Permanent sublethal hearing injuries, although possible, are unlikely to occur based on current and anticipated future impact avoidance and minimization requirements. Other sources of noise from wind projects include helicopters and aircraft used for transportation and facility monitoring, G&G surveys, WTG operation, and vessel traffic associated with these activities.

Table 3.12-3. Injury and Behavioral Disturbance Thresholds for Sea Turtles

Response	Metric	Threshold Level
Behavioral	SPL (dB re 1 µPa)	175 dB
Injury	L_{pk} (dB re 1 µPa)	232 dB
Injury (impulsive)	SEL (dB re 1 μPa^2s)	204 dB
Injury (non-impulsive)	SEL (dB re 1 µPa2s)	220 dB

Source: DoN 2017

Notes:

µPa = micropascal(s); μPa^2s = micropascal squared second; dB = decibel(s); L_{pk} = peak sound pressure level; SEL = sound exposure level; SPL = sound pressure level

The noise associated with offshore wind project construction and operation generally falls into two categories: (1) impulsive noise sources, such as impact pile driving, which generate sharp instantaneous changes in sound pressure and (2) non-impulsive noise sources, such as vessel engine noise, vibratory pile driving, and WTG operation, which remain relatively constant and stable over a given time period.

Impulsive and non-impulsive noise sources associated with offshore wind projects and other activities likely to occur on the OCS in the future are discussed below.

G&G Survey noise: Without mitigation, certain types of G&G surveys could result in long-term, high-intensity impacts on sea turtles. These effects may include behavioral avoidance of the ensonified area and increased stress; temporary loss of hearing sensitivity; and permanent auditory injury depending on the type of sound source, distance from the source, and duration of exposure; however, G&G noise resulting from offshore wind site characterization surveys is of less intensity than the acoustic energy characterized by seismic air guns and affects a much smaller area than G&G noise from seismic air gun surveys typically associated with oil and gas exploration. Although seismic air guns are not used for offshore wind site characterization surveys, sub-bottom profiler technologies that are hull-mounted on survey vessels may incidentally harass sea turtles and would require mitigation and monitoring measures.

None of the equipment operated during these surveys has source levels loud enough to result in PTS or TTS based on the peak or cumulative exposure criteria. Therefore, physical effects are extremely unlikely to occur. Sea turtles exhibit a behavioral response when exposed to received SPL levels of 175 dB, and some noise generated from G&G surveys is within their hearing range. Based on analysis of the potential for effects to ESA-listed species from G&G surveys in the Greater Atlantic Region performed by NMFS (Table 5 in NMFS 2021), the distance to the behavioral threshold for sea turtles is 131 ft (40 m) for boomers and bubble guns, and for sparkers, it is 295 ft (90 m) (NMFS 2021). Thus, a sea turtle needs to be within 295 ft (90 m) of the source to be exposed to potentially disturbing levels of noise. It is expected that sea turtles would react to this exposure by swimming away from the sound source; this limits exposure to a short time--just the few seconds it would take an individual to swim away to avoid the noise. The risk of exposure to potentially disturbing levels of noise is reduced by the use of PSOs to monitor for sea turtles. At the start of a survey, equipment cannot be turned on until the clearance zone is clear of turtles for at least 30 minutes. This condition is expected to reduce the potential for sea turtles to be exposed to noise that may be disturbing; however, even if a sea turtle is submerged and not seen by the PSO, it is expected that sea turtles would avoid the area ensonified by the survey equipment that they can perceive (NMFS 2021). This avoidance behavior would ensure that the duration of exposure was short and unlikely to accumulate to causing TTS or PTS.

Because the area where increased underwater noise would occur is transient and increased underwater noise would only be experienced in a particular area for only seconds, it is expected that any effects to behavior would be minor and limited to a short-term disruption of normal behaviors, short-term avoidance of the ensonified area, and minor additional energy expenditure spent while swimming away from the noisy area. If foraging or migrations are disrupted, they would quickly resume once the G&G survey vessel leaves the area. No sea turtles would be displaced from a particular area for more than a few minutes. While the movements of individual sea turtles would be affected by the sound associated with the survey, these effects are short-term (seconds to minutes) and localized (avoiding an area no larger than 295 ft [90 m]) (NMFS 2021), and there would be only a minor and short-term impact on foraging, migrating, or resting sea turtles. Effects to individual sea turtles from brief exposure to potentially disturbing levels of noise would be minor and limited to a brief startle, a short increase in swimming speed, and/or short-term displacement and would be so small that they cannot be meaningfully measured, detected, or evaluated. BOEM has concluded that disturbance of sea turtles

from underwater noise generated by site characterization and site assessment activities would likely result in short-term displacement and other behavioral or nonbiologically significant physiological consequences (i.e., no injury or mortality would occur), and impacts on sea turtles would be short-term and minor.

Impact pile driving noise: The most significant impulsive noise source associated with offshore wind projects is pile-driving noise during the construction phase. WTG foundation installation involves impact pile driving, which produces high SPLs in both the surrounding in air and underwater environments. A typical foundation pile installation generates 4 to 6 consecutive hours of impulsive or vibratory noise with intensity levels like those described for the Proposed Action (see Section 3.12.5). Potential noise exposure events would occur intermittently over several weeks during the allowable construction window (which may vary and would be determined through consultation with NMFS) in the sea turtle GAA. Under the No Action Alternative, construction of additional offshore structures would generate short-term and intermittent impulsive underwater noise with the potential to impact sea turtles. These effects would be limited to specific construction windows beginning in 2022 and continuing through 2030.

Due to the anticipated frequency and spatial extent of effects, impulsive underwater noise from impact pile driving during planned offshore wind development represents the highest likelihood for exposure of individual sea turtles to adverse impacts from noise. Although these potential impacts are acknowledged, their potential significance is unclear because sea turtle sensitivity and behavioral responses to underwater noise are a subject of ongoing study (Elliott et al. 2019; Renewables Consulting Group 2018). Potential behavioral impacts may include altered submergence patterns, short-term disturbance, startle response (diving or swimming away), and short-term displacement of feeding / migrating and a short-term stress response, if present within the ensonified area (NSF and USGS 2011; Samuel et al. 2005). The accumulated stress and energetic costs of avoiding repeated exposure to pile-driving noise over a season or a life stage could have long-term impacts on survival and fitness (DoN 2018). Conversely, sea turtles could become habituated to repeated noise exposure over time and not suffer long-term consequences (O'Hara and Wilcox 1990). This type of noise habituation has been demonstrated for sea turtles even when the repeated exposures were separated by several days (Bartol and Bartol 2011; DoN 2018).

Sea turtles that are close to impact pile driving could experience a short-term or permanent loss of hearing sensitivity. In theory, reduced hearing sensitivity could limit the ability to detect predators and prey or find potential mates, reducing the survival and fitness of affected individuals; however, the role and importance of hearing in these biological functions for sea turtles remain poorly understood (Lavender et al. 2014).

Mitigation measures such as those described in the PSMMP for Sea Turtles (LGL Ecological Research Associates 2022) would be required in all offshore wind development projects, and impacts to sea turtles from construction-related noise is likely to be limited to short-term impacts on a small number of individuals. Short-term impacts on individuals would not be significant at the population level and would be minor overall.

MEC/UXO clearance noise: Planned offshore wind activities may encounter UXO on the seabed in their lease areas or along export cable routes. While non-explosive methods may be employed to lift and

move these objects, some may need to be removed by explosive detonation. Underwater explosions of this type generate high pressure levels that could cause disturbance and injury to sea turtles, but the number of affected individuals would be small relative to the population sizes. The number and location of detonations that may be required for planned projects as well as the Proposed Action are relatively unknown. Impacts associated with UXO detonations for other projects would be similar to those described and modeled for the Proposed Action in Section 3.12.5.1.

Non-Impulsive noise: Non-impulsive underwater noise sources in the GAA include baseline noise levels from commercial, military and government, research, and recreational vessel traffic; aircraft; and offshore development activities. The planned development of other wind energy facilities would contribute additional new sources of intermittent non-impulsive underwater noise, including helicopters and fixed-wing aircraft, construction and O&M vessels, and vibratory pile driving during construction. Operational noise from WTGs constitutes a low-level, non-impulsive underwater noise source throughout the life of a given project.

Aircraft noise: Helicopters and fixed-wing aircraft may be used during initial site surveys, protected species monitoring prior to and during construction, and facility monitoring. Sea turtle responses to aircraft noise and disturbance is not well documented. Researchers have speculated that sea turtles are not highly sensitive to disturbance from aircraft (Jean et al. 2010). Helicopters and aircraft would operate at altitudes of 1,000 ft (300 m) or more except when helicopters are landing or departing from service vessels. NMFS (2020) determined that noise and disturbance effects on sea turtles from aircraft used for construction and O&M of the Vineyard Wind offshore wind facility would be insignificant. Based on this information, cumulative effects on sea turtles from aircraft used for wind energy development on the OCS would be negligible.

Vibratory pile driving noise: Vibratory pile driving used during submarine cable and port facility construction is the most intensive source of non-impulsive underwater noise expected to result from planned offshore wind energy development. Typical noise levels generated by vibratory pile driving used for facility development and port improvements are below thresholds associated with potential hearing injury in sea turtles. Vibratory pile-driving noise can exceed levels above behavioral disturbance thresholds (Table 3.12-3) for sea turtles but only within a short distance (i.e., less than 33 ft [10 m]) from the source using the NMFS Multispecies Pile Driving Calculator (Version 1.1, NMFS Protected Species Division, Silver Spring, Maryland). Given this low probability of exposure to above-threshold vibratory pile-driving noise and the fact that vibratory pile-driving activities would be limited in extent, short-term in duration, and widely separated, vibratory pile-driving noise effects on sea turtles would be negligible.

Vessel noise: Construction and operational vessels are the most broadly distributed source of continuous non-impulsive noise associated with offshore wind projects. Ocean-going vessels associated with ongoing and planned activities could potentially result in long-term but infrequent impacts on sea turtles, include temporary startle responses, masking of biologically relevant sounds, physiological stress, and behavioral changes, especially their submergence patterns (Samuel et al 2005). Sea turtle exposure to underwater vessel noise would incrementally increase as a result of planned offshore wind projects, especially during construction periods. Applying vessel activity estimates developed by BOEM based on their 2019 study *National Environmental Policy Act Documentation for Impact-producing Factors in the*

Offshore Wind Cumulative Impacts Scenario on the North Atlantic Outer Continental Shelf (BOEM 2019b), vessel activity could peak in 2024, with as many as 379 vessels involved in the construction of reasonably foreseeable projects (see Appendix E for details); however, this increase must be considered relative to the baseline level of vessel traffic.

Annual baseline traffic measured from July 1, 2018, to June 30, 2019, showed 172,267 transits in the Marine Traffic Study Area surrounding the WEA (Appendix X, COP; DNV-GL 2022). Assuming that construction of up to five lease areas could be active at the same time, and assuming similar levels of vessel traffic as estimated for SRWF (323 vessel transits over a 2-year construction period, or 162 per year), construction activities could result in an increase of 810 transits of the WEA per year. This would represent an increase in vessel traffic of approximately 0.5 percent over baseline conditions, with most of the transit travel occurring in existing sea lanes from ports to the WEA. Due to the small change in vessel traffic from the baseline, and limited impact of vessel noise to sea turtles, no injury or behavioral effects from vessel noise are anticipated for planned offshore wind projects. Although sea turtles could become habituated to repeated noise exposure over time (Hazel et al. 2007), vessel noise effects for other wind farm development projects are expected to be broadly similar to noise levels from existing vessel traffic in the region. Nearly all vessels generate SPL of 190 dB or less and would not generate noise above the disturbance thresholds at distances greater than 10 m (Hatch et al. 2008). Nonetheless, periodic localized, intermittent, and short-term behavioral impacts on sea turtles could occur. Based on sea turtle responses to other types of disturbance such as vessel traffic or drone operation (e.g., Bevan et al. 2018), turtle behavior is expected to return to normal when vessel noise dissipates. Given sea turtles' apparent tolerance exposure to high-level underwater noise produced by vessels, the short-term nature of any behavioral responses, and the patchy distribution of sea turtles in the GAA, the effects of vessel noise from future activities on sea turtles would be negligible.

WTG operation noise: The maximum anticipated noise levels produced by operational WTGs are below recommended thresholds for sea turtle injury and behavioral effects. Sea turtles appear to habituate to repetitive underwater noise not accompanied by an overt threat (Bartol and Bartol 2011; DoN 2018; Hazel et al. 2007). This suggests that even if WTGs generate noise detectable to sea turtles in the immediate proximity, the exposed individuals are not expected to experience measurable adverse effects. The effects of operational noise from future wind farm development on sea turtles would be negligible.

Ongoing non-impulsive noise due to future wind farm actions and associated vessel traffic and the operation of WTGs is persistent and expected to continue indefinitely; however, because of sea turtles' apparent tolerance for non-impulsive sources and the small area and short duration they may experience effects, non-impulsive noise would have a negligible effect on sea turtles.

Electric and Magnetic Frequency (EMF): Under the No Action Alternative, several thousand miles of new submarine electrical transmission cables would be added in the GAA for sea turtles. Each cable would generate EMF effects within the immediate proximity. Submarine power cables emit anthropogenic EMF that can interact with natural geomagnetic EMF, potentially affecting the behavior of electromagnetic sensitive species by disrupting cues. EMF are generated by current flow passing through power cables during operation and can be divided into electric fields and magnetic fields (Taormina et al. 2018).

Magnetic fields have a second induced component, a weak electric field, or an induced electric field. Both electric and magnetic fields rapidly diminish in strength with increasing distance from the source.

The available evidence indicates that sea turtles are magnet-sensitive and orient to the earth's magnetic field for navigation. Although sea turtles may detect magnetic fields as low as 0.05 milligauss (mG), they are unlikely to detect magnetic fields below 50 mG (Normandeau et al. 2011; Snoek et al. 2016). Potential EMF effects are be reduced by cable shielding and burial to an appropriate depth. New submarine cables would be installed to maintain a minimum separation of at least 330 ft (100 m) from other known cables to avoid damaging existing infrastructure during installation. This separation distance avoids additive EMF effects from adjacent cables. Although artificial EMF effects on sea turtles are not well studied, the affected areas are be localized around unburied cable segments and limited to within 10 to 25 ft (3 to 7.5 m) of the cable surface (Snyder et al. 2019). Deviations in migration, therefore, would be small and would not significantly impact energy expenditure in sea turtles. EMF impacts from future non-Project activities would be negligible.

Accidental releases - contaminants: Toxic contaminants could be accidentally released as a result of increased human activity associated with future offshore wind construction activities. Aquatic contaminant exposure could result in mortality, and sublethal effects could impact many of the species' physiological systems during all life stages (Bembenek-Bailey et al. 2019; Mitchelmore et al. 2017; Shigenaka et al. 2010; Vargo et al. 1986). Sea turtles may be affected sublethally in a variety of ways which could include experiencing depressed immune system function; poor body condition; and reduced growth rates, fecundity, and reproductive success (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). Furthermore, accidental releases may indirectly impact sea turtles by impacting prey species; however, all vessels would comply with USCG regulations, and wind farm construction projects would comply with additional BOEM requirements that avoid and minimize accidental releases of fuel, oil, and other potential aquatic contaminants. Therefore, potential accidental releases would not appreciably contribute to adverse impacts to sea turtles, and these impacts would be negligible.

Accidental releases - trash and debris: All species of sea turtles have been documented ingesting plastic fragments (Bugoni et al. 2001; Hoarau et al. 2014; Nelms et al. 2016) and a variety of other anthropogenic waste (Tomás et al. 2002), likely mistaking debris for potential prey items (Schuyler et al. 2014). Ingesting trash or exposure to aquatic contaminants could be lethal to sea turtles; however, sea turtles may be affected subtly in a variety of ways, which could include experiencing depressed immune system function; poor body condition; and reduced growth rates, fecundity, and reproductive success (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). Sea turtles could additionally become entangled in debris, causing lethal or injurious impacts. Entanglement in lost fishing gear is a significant cause of mortality in both juvenile and adult sea turtles and was noted as a threat to recovery for multiple ESA-listed turtles in the marine environment (NMFS and USFWS 1991b, 1992; NMFS 2011). Based on a recent global review, 5.5 percent of encountered sea turtles were found to be entangled, and 90.6 percent of these were dead (Duncan et al. 2017). Lost or discarded fishing gear was associated with most of these entanglements and is acknowledged as a major cause of mortality for listed sea turtles.

Although these effects are acknowledged, the likelihood of adverse population-level impacts on sea turtles from accidental releases of debris or contaminants from future offshore wind activities on the OCS is low. Current regulations and requirements imposed on federally approved activities prohibit vessels from dumping potentially harmful debris in United States waters. While precautions to prevent accidental releases would be employed by vessels and port operations associated with future offshore wind development, it is likely that some debris could be lost overboard during construction, maintenance, and routine vessel activities; however, the amount would likely be miniscule compared to other inputs already occurring. In the event of a release, it would be an accidental, low-probability event in the vicinity of project areas or the areas from ports to the project areas used by vessels. Based on these factors, accidental releases of trash and debris from federally approved activities on the OCS are not expected to appreciably contribute to adverse sea turtle impacts, and therefore the effects of the No Action Alternative would be negligible.

Traffic: Vessel strike is an increasing concern for sea turtles. The percentage of loggerhead sea turtles stranded with injuries consistent with vessel strikes increased from approximately 10 percent in the 1980s to 20.5 percent in 2004, although an unknown number may have been struck postmortem (NMFS and USFWS 2007). Sea turtles are expected to be most susceptible to vessel collision in shelf waters, where they forage. Furthermore, they cannot reliably avoid being struck by vessels exceeding 2 knots (Hazel et al. 2007); typical vessel speeds in the GAA may exceed 10 knots. Up to 70 vessels associated with offshore wind development may operate in the GAA during the peak construction period in 2025. Additional fishing vessels may be present in the vicinity due to the expected increase in fish biomass around the WTG structures. Increased vessel traffic could result in sea turtle injury or mortality; however, the proportional increase in vessel traffic from baseline would be minimal (refer to Section 3.19, *Navigation and Vessel Traffic*, and Appendix E). Green, loggerhead, and Kemp's ridley sea turtle populations have generally been increasing over the past few decades, while leatherback sea turtle populations have declined. Despite the potential for individual fatalities, no population-level impacts on sea turtles are expected based on occurrence and potential exposure and the low number of additional strikes from wind turbine vessel traffic.

Lighting: Assuming other future offshore wind projects employ the same mitigation measures included in the proposed Project, impacts to sea turtles from nighttime artificial lighting associated with offshore structures and vessels could represent a source of attraction, avoidance, or other behavioral responses in sea turtles. Although responses to light have been studied in various species and life stages of sea turtles in nesting beach environments, the effects of offshore lighting remain uncertain. Shoreline development is the predominant existing artificial lighting source in the nearshore component of the GAA, whereas vessels, mainly fishing vessels, are the predominant artificial lighting source offshore. Future wind energy development would contribute additional light sources to the offshore component of the GAA, including a short-term increase in light from vessels used during construction, and the long-term use of navigational lighting on new WTGs and OSSs. An estimated 3,210 foundations are forecasted for future wind energy construction. Each structure would have minimal yellow flashing navigational lighting as well as red flashing FAA hazard lights in accordance with BOEM's (2019a) guidelines. Although the potential effects of offshore lighting on juvenile and adult sea turtles is uncertain, WTG lighting is anticipated to have a negligible effect on sea turtles based on the current lack of evidence that platform

lighting leads to effects on sea turtles, as shown by decades of oil and gas platform operation in the Gulf of Mexico, which can have considerably more lighting than offshore WTGs (BOEM 2019a).

Presence of structures: The addition of additional new offshore foundations in the GAA could increase sea turtle prey availability by creating new hard-bottom habitat, increasing pelagic productivity in local areas, or promoting fish aggregations at foundations (Bailey et al. 2014). Sections 3.7, *Benthic Habitat,* and 3.10, *Finfish, Invertebrates, and Essential Fish Habitat,* discuss reef creation and altered water flow in detail. The significance of this reef effect is unknown but is not expected to result in biologically significant impacts to sea turtles given the broad geographic range of species during their annual foraging migrations.

The presence of structures could indirectly concentrate recreational fishing around foundations, which could indirectly increase the potential for sea turtle entanglement in both lines and nets (Gall and Thompson 2015; Nelms et al. 2016; Shigenaka et al. 2010). Entanglement in both lines and nets could lead to injury and mortality due to abrasions, loss of limbs, and increased drag, leading to reduced foraging efficiency and ability to avoid predators (Barreiros and Raykov 2014; Gregory 2009; Vegter et al. 2014). Between 2016 and 2018, 186 sea turtles were documented as hooked or entangled with recreational fishing gear (BOEM 2021). Due to the high number of foundations in a GAA, it is likely that recreational and for-hire fisheries would avoid overcrowding structures by dispersing effort across many WTG foundations; however, the risk of entanglement and hooking or ingestion of marine debris could slightly increase, since both fishers and turtles may be attracted to the same areas.

Structural elements of WTGs are likely to be present for the 25- to 35-year operational life of each generator. Once WTGs and OCS-DC have foundations have been installed within the seafloor, the presence of the operating WTGs would have converted the existing open water habitat to one with increased hard bottom, making it comparable to an artificial reef-like habitat. The presence of the WTG foundations, scour protection, and IAC protection creates three-dimensional hard-bottom habitats resulting in a reef effect that is expected to attract numerous species of algae, shellfish, finfish, and sea turtles (Langhamer 2012; Reubens et al. 2013; Wilhelmsson et al. 2006). Sea turtles have been observed within the vicinity of offshore structures, such as oil platforms, foraging and resting under the platforms (Gitschlag and Herczeg 1994; National Research Council 1996). High concentrations of sea turtles have been reported around these oil platforms (Gitschlag and Herczeg 1994; National Research Council 1996).

As a result of the increased habitat and foraging opportunities at the new artificial reef-like habitat, sea turtles could potentially remain in areas longer than they normally would and could become susceptible to cold stunning or death; however, artificial habitat created by these offshore structures can provide multiple benefits for sea turtles, including foraging habitats, shelter from predation and strong currents, and methods of removing biological buildup from their carapaces (Barnette 2017; National Research Council 1996). It is estimated that offshore petroleum platforms in the Gulf of Mexico, provided an additional 2,000 mi^2 (5,180 km^2) of hard-bottom habitat (Gallaway 1981). Wakes created by the presence of the foundations may influence distributions of drifting jellyfish aggregations potentially impacting the distribution of leatherbacks but not the overall availability of prey species. Primary prey species for other sea turtle species would not be affected by these wakes. Because of this, impacts on sea turtle foraging are not expected to be substantial (Kraus et al. 2019).

On this basis, BOEM concludes that the presence of visible structures from O&M would have negligible direct effects on sea turtle movement and migration, and negligible to minor beneficial, long-term, indirect effects on the distribution, abundance, and availability of sea turtle prey and forage resources.

Port utilization: Any port expansions could increase the total amount of disturbed benthic habitat (see Alternative A - No Action discussion) and result in impacts on some sea turtle prey species; however, given that port expansions would likely occur in subprime areas for foraging, and the disturbance would be relatively small in comparison to the overall sea turtle foraging areas in the GAA, port expansions are not expected to impact sea turtles. Dredging for port facility improvement could lead to additional impacts on turtles from incidental entrainment, impingement, or capture. Dredging impacts on sea turtles are relatively rare, with most observed injury and mortality events in the United States associated with hopper dredging in and around core habitat areas in the southern portion of the GAA and along the Gulf Coast (Michel et al. 2013; USACE 2020). Ongoing maintenance dredging of these facilities may incrementally increase related risks to individual turtles over the lifetime of the facilities; however, typical mitigation measures such as timing restrictions should minimize this potential. Given the available information, the risk of injury or mortality of individual sea turtles resulting from dredging associated with the projects considered here is low and population-level effects are unlikely to occur. Therefore, associated effects of port expansions on sea turtles would be long term and minor. Potential vessel traffic impacts associated with port use are described under the Vessel Traffic section.

Climate change: Global climate change could result in population-level impacts on sea turtle species by displacement, impacts on prey species, altered population dynamics, and increased mortality. It is well established that climate change has the potential to affect the distribution and abundance of sea turtles and their prey due to changing water temperatures, ocean currents, and increased acidity. Furthermore, rising sea levels and increased storm intensity may negatively affect turtle nesting beaches. Increasing air temperatures can affect sea turtle population structure because temperature-dependent sex determination of embryos would result in a shift toward more female-biased sex ratios (Poloczanska et al. 2009). Patel et al. (2021) used global climate models to predict that the future distribution of suitable thermal habitat for loggerheads along the OCS will likely increase in northern regions. Sea turtle nesting could also shift northward on the U.S. Atlantic coast. Because these changes may affect sea turtle reproduction, survival, and demography, the impacts of climate change on sea turtles are expected to be minor.

3.12.3.3 Impacts of Alternative A – No Action on ESA-Listed Species

All sea turtles that are likely to occur in the proposed Project Area are listed as threatened or endangered under the ESA, therefore the effects to these species would the same as described above. Based on the information contained in this document, we anticipate that the reasonably foreseeable offshore wind activities are likely to have **minor** adverse impacts to leatherback, loggerhead, Kemp's ridley, and green sea turtles.

3.12.3.4 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and conceptual decommissioning would not occur; and potential impacts associated with the Project to sea turtles would not occur. Sea turtles would continue to be affected by current environmental trends and ongoing activities that would continue to have short-term to long-term impacts on sea turtles, primarily through construction-related lighting, noise, habitat alternation, collision risk, and artificial reef effect.

BOEM anticipates that the sea turtle impacts due to current environmental trends and ongoing activities associated with the No Action Alternative would be **minor** adverse with the potential for **minor beneficial** impacts.

Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, existing environmental trends and ongoing activities, natural and human-caused IPFs would continue to affect sea turtles. BOEM anticipates that the overall cumulative impacts associated Alternative A, the No Action Alternative, when combined with all other planned activities (including offshore wind) in the GAA would result in overall **minor** adverse and **minor beneficial** impacts.

3.12.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on sea turtles:

- The number of WTGs;
- Installation methods;
- The time of year during which construction occurs.

Variability of the proposed Project design exists as outlined in Appendix C. Below is a summary of potential variances in impacts:

- WTG number and locations: the level of hazard related to WTGs is proportional to the number of WTGs installed; fewer WTGs would result in lower behavioral disturbance and decreased risk of TTS for sea turtles during construction and installation and O&M. The potential reductions included in Alternative C may reduce the extent and number of individuals affected but would not lower the overall impact level.
- Final installation methods: any variance to installation methods or materials used for the assumptions described in the COP, Appendix I1 (Küsel et al. 2022), may result in large changes to the areas where sea turtles may experience TTS, or behavioral effects. Potential changes to installation methods may reduce or increase the extent and number of individuals affected but would not alter the overall impact level to sea turtles.

- Offshore export cable routes: the route chosen (including variants within the general route) would determine the amount of seafloor disturbance and duration of sediment suspension but would not alter the level of impacts to sea turtles.
- Season of construction: different sea turtles are present and active in the proposed Project Area at different times of year. Construction when fewer sea turtles are present would have a lesser impact than construction when higher numbers are present. Changes to the construction schedule could alter the number of individuals affected or change which species are primarily affected. This would not change the overall impact determination but may help reduce impacts to species whose populations are more sensitive to impacts.

3.12.5 Impacts of Alternative B - Proposed Action on Sea Turtles

The activities associated with offshore SRWF (up to 94 11-MW WTGs out of 102 potential positions) and SRWEC-OCS/SRWEC-NYS cabling, and OnCS-DC, transmission cable, and interconnection cable with Alternative B include construction and installation, O&M, and decommissioning. These actions have the potential to cause both direct and indirect impacts to sea turtles. The IPFs associated with construction and post-construction O&M activities include accidental releases, seafloor disturbance, sediment suspension, and deposition, electric and magnetic fields, lighting, noise, presence of structures, traffic, and port utilization. These IPFs are thoroughly discussed in the sea turtle assessment prepared for this Project (Sunrise Wind 2023). The conclusions of the sea turtle assessment are presented in this section and include consideration of the Project's mitigation and monitoring measures (Appendix H).

3.12.5.1 Construction and Installation

3.12.5.1.1 Onshore Activities and Facilities

No regular sea turtle nesting occurs in the onshore portion of the proposed Project Area (refer to Section 3.12.1). No project activities are expected to be conducted in beach locations where nests may occur. Cable installation would be done through HDD underneath beaches, avoiding impacts to these areas, and would not cross underneath known sea turtle nesting sites. Construction and operation of onshore facilities is not expected to have any direct impacts to sea turtles, and the potential for impacts is negligible.

3.12.5.1.2 Offshore Activities and Facilities

Construction impacts to sea turtles could occur from the following IPFs: seafloor disturbance, sediment suspension and deposition, noise, electric and magnetic fields, discharges and release, trash and debris, vessel traffic, and lighting. Unless noted otherwise, construction-related impacts would be short-term. The potential for these impacts to occur are discussed in detail in the following sections.

Seafloor disturbance: During construction of the SRWF, seafloor disturbances would be associated with seafloor preparation, placement of scour protection/cable protection, foundation installation, vessel anchoring and jack-up, and IAC installation. These seafloor disturbances could directly impact benthic species such as mollusks and crabs which are prey for sea turtles. As foundations, anchors, and/or jack-ups are placed on the seafloor, direct injury or mortality could occur to benthic species residing within

the footprint of the foundations. As discussed for benthic resources (see Section 3.7.5.1), 1 to 3 years for benthic communities to recover to preimpact levels, based on the results of a number of studies on benthic recovery; however, the footprint of direct benthic impacts within the SRWF are minimal when compared to the ample available bottom habitat surrounding the SRWF. Additionally, mobile benthic species are likely to vacate the area during construction activities, avoiding direct injury/mortality.

A number of methodologies for sand wave leveling and cable installation are being considered to prepare the seafloor and install the IAC within the SRWF (e.g., suction hopper dredge, mechanical plow, jet plow) (see Section 3.3.3.4 in COP, Sunrise Wind 2023). The suction hopper dredging technique recovers and relocates excavated materials from one location to another. A drag head is towed over the sand by a vessel while a pump pulls fluidized sand into the vessel's storage hopper. Any sediment removed would be relocated within the local sand wave field along the IAC. Once full, the vessel would relocate to a designated storage or disposal area to offload materials. Excavation activities have the potential to disturb, catch, or entrain sea turtles that may not have moved away from the source of the activity quickly enough (Murray 2011). This potential impact is most likely to harm resting turtles offshore and juveniles utilizing nearshore areas; however, the risk of injury to sea turtles from hopper dredges in particular is expected to be lower in the open ocean, compared to within navigational channels (Michel et al. 2013; USACE 2020). This may be due to the lower density of sea turtles in offshore waters, and the ability to move away from an active drag head. Consultations with agencies in development of EPMs such as the use of PSOs (as detailed below) are likely to reduce risk of injury or mortality of individual sea turtles although included measures are unlikely to eliminate risk of entrainment for sea turtles.

Potential impacts to sea turtles from seafloor disturbance are expected to include direct impact/injury to benthic prey, temporary loss of habitat for benthic prey species, and injury/mortality from use of installation techniques such as a suction hopper dredge; however, given the transient and short duration of construction activities (approximately 18 months), the wide availability of prey outside the SRWF, the ample available habitat surrounding the localized area of disturbances, and EPMs, impacts on sea turtles from seafloor disturbances during construction of the SRWF are expected to be short-term and minimal. Because individual sea turtles may be injured or killed, but no population-level impacts are anticipated, the construction activities for the SRWF would have a minor short-term impact on sea turtles.

Sediment suspension and deposition: SRWF construction activities associated with seafloor preparation, foundation installation, placement of scour protection/cable protection, vessel anchoring and jack-up, and IAC installation would directly result in short-term, localized increases in sediment suspension within the water column, which would increase turbidity. Increased turbidity could decrease visibility for sea turtles, potentially restricting predation efficiency. Additionally, the effects of turbidity on prey species (as discussed in Section 3.7 *Benthic Resources* and Section 3.10 *Finfish, Invertebrates, and Essential Fish Habitat*) could disrupt available forage for sea turtles and cause avoidance behavior within localized construction areas.

The extent of turbidity depends on sediment type and size as well as the expected duration of the sediment-disturbing activities. For example, sediment-disturbing activities in sandy substrates with larger (heavier) particles typically result in shorter periods of elevated turbidity compared to similar work in

areas with greater silt and clay content. The longer the disturbance continues, the longer the sediments are expected to be suspended within the water column.

Appendix H (*Sediment Transport Modeling Report*) (Woods Hole Group 2022) of the COP provides further information on suspended sediments from installation of the IAC in federal waters. As detailed in Section 3.7, *Benthic Resources,* and Section 3.10, *Finfish, Invertebrates, and Essential Fish Habitat,* only short-term, limited impacts to fish and invertebrates are expected from suspended sediments; therefore, secondary effects on sea turtle prey availability are not expected. As described in the COP, Appendix H (Woods Hole Group 2022), TSS concentrations are predicted to return to ambient levels (less than 10 mg/L) within 0.4 hours following installation of the modeled SRWEC-OCS cable corridor centerline and within 0.34 hours following installation of the modeled SRWEC-NYS cable corridor centerline. Furthermore, the TSS plumes were shown to be primarily contained within the lower portion of the water column, approximately 9.8-ft (3.0-m) above the seafloor for both SRWEC-OCS and SRWEC-NYS installation. This limited temporal effect over a relatively small area are not expected to interfere with sea turtle foraging success.

Based on the relatively low anticipated density of sea turtles within the SRWF and the expected short-term and localized increases in turbidity, impacts on sea turtles are expected to be short-term and minor.

Noise: Sea turtles may be adversely impacted by underwater noise produced during the construction of the SRWF. The main sources of noise during the construction phase would be G&G surveys, MEC/UXO surveys (requiring potential G&G to locate MEC/UXOs), pile driving activities, and vessel traffic. Underwater noise could result in physiological and/or behavioral effects to sea turtles, including potential auditory injuries, short-term disturbance or displacement, and possible startle or stress responses. A detailed explanation of predicted noise levels is provided in COP, Appendix I1 (Küsel et al. 2022).

Limited research was conducted on the physiological impacts of underwater sound on sea turtles, and very few data are available on the behavioral responses of sea turtles to noise; however, the data available suggest that sea turtles can detect acoustic stimuli and respond behaviorally (Dow Piniak et al. 2012). While general hearing sensitivities for all species are below 2 kHz, primary hearing frequency ranges of sea turtle vary by species and life stage (Bartol and Ketten 2006; Bartol et al. 1999; Dow Piniak et al. 2012; Martin et al. 2012; Piniak et al. 2016).

The studies available on underwater noise impacts to sea turtles examine the behavioral responses of loggerhead and green sea turtles to underwater noise produced by seismic guns. Behavioral responses observed during seismic surveys included avoiding the source of the sound (O'Hara and Wilcox 1990), startle reactions (DeRuiter and Doukara 2012), and increased swimming speeds (McCauley et al. 2000). Other possible behavioral responses could include increased surfacing time and decreased foraging. McCauley et al. (2000) reported that SPL of 166 dB re 1 µPa from seismic air guns corresponded with observed behavioral reactions in sea turtles. Increased surface time increases the risk of vessel strike as described in the analysis for vessel traffic.

BOEM and NOAA have adopted the sea turtle injury thresholds based on the dual criteria of L_{pk} and SEL recommended by Popper et al. (2014) and the U.S. Navy (Blackstock et al. 2018) and adopted by NOAA Fisheries (GARFO 2020, 2021a). Table 3.12-3 summarizes the agency-adopted acoustic thresholds for sea

turtles, which are used to evaluate noise impacts to sea turtles from impulsive sounds from impact pile driving and non-impulsive sounds generated by vessel traffic.

Table 3.12-4 summarizes thresholds for underwater noise effects and the highest-modeled distances ($R_{95\%}$) to injurious and behavioral effects from both impulsive and intermittent non-impulsive construction-related underwater noise levels (Küsel et al. 2022). Potential effects were modeled over a range of potential construction schedules, and the results for the highest level of potential impacts among all the construction schedules are included in this document.

Table 3.12-4. Modeled Radial Distances ($R_{95\%}$) to Effect Thresholds for Elevated Underwater Noise from Project Pile Installations: OCS-DC Foundation and WTG Monopile Installation (up to four 12-meter monopiles and four pin piles installed in a day using impact hammer pile driving); 1.2-meter-diameter Casing Pile via Impact Hammer; and Goal Posts Sheet Piles via Vibratory Hammer for Cofferdam Installation

Noise Source	Injurious Effects		Behavioral Effects
	Distance to L_{pk} Single Strike Injury Threshold (mi; 232 dB re: 1 µPa)	Distance to SEL Injury Threshold (mi)1	Distance to SPL Behavioral Threshold (mi) (175 dB re: 1 µPa)
12-m Monopile and OCS-DC foundation[2] – impact installation (impulsive)	0	1.37	1.02
Casing Pipe (1.2-m diameter) - impact installation	0	0.26	0.18
Goal Posts – vibratory sheet pile installation (non-impulsive noise)	0	0	>0.01

Notes: µPa = micropascal; μPa^2 = squared micropascal; dB = decibel(s); L_{pk} = peak sound pressure level; m = meter; mi = mile(s); OCS-DC = Offshore Converter Station; SEL = sound exposure level; SPL = sound pressure level

Source: COP, Appendix I1 (Küsel et al 2022).

[1] Injury thresholds are different for impulsive (204 dB re 1 μPa^2/second) and non-impulsive (220 dB re 1 μPa^2/second) noise. See Table 3.12-3.

[2] Monopile foundation values reflect the maximum possible effect area from a difficult installation of a 12-m-diameter pile with 10-dB broadband attenuation.

G&G survey noise: Short-term, localized G&G surveys during the construction period may include the use of multi-beam echosounders, side-scan sonar, shallow penetration sub-bottom profilers, medium penetration sub-bottom profilers and marine magnetometers. Site-specific verification was previously conducted for geophysical equipment sound sources deployed within the marine portions of the proposed Project Area. The survey equipment to be employed would be equivalent to the equipment utilized during the G&G survey campaigns associated with Lease Area OCS-A 0500 conducted in 2016, 2017, 2018, 2019, and 2020 and within Lease Area OCS-A 0487 conducted in 2018, 2019, and 2020 (Gardline 2021a, 2021b; Smultea Sciences 2020a, 2020b).

G&G surveys use a combination of sonar-based methods to map shallow geophysical features. The equipment is towed behind a moving survey vessel attached by an umbilical cable. G&G equipment operating are frequencies at or below 2,000 Hz (typically sub-bottom profilers) may be audible to sea turtles. Equipment such as echosounders and side-scan sonar operate at higher frequencies and have no effect on sea turtles. The equipment only operates when the vessel is moving along a survey transect, meaning that the ensonified area is intermittent and constantly moving. BOEM (2021) evaluated potential underwater noise effects on sea turtles from G&G surveys and concluded there is no possibility of PTS in sea turtles from G&G sound sources. Some G&G survey noise sources could exceed the behavioral effects threshold up to 300 ft (91.4 m) from the source, depending on the type of equipment

used, but given the limited extent of potential noise effects and the APMs used in this Project (e.g., soft-start measures, shutdown procedures, protected species monitoring protocols, use of qualified and NOAA-approved PSOs), adverse impacts to sea turtles are unlikely to occur. BOEM (2021) concluded that planned G&G survey activities across the entire Mid-Atlantic OCS are unlikely to cause PTS injury to sea turtles. While low-level behavioral exposures could occur, these would be limited in extent and short-term in duration. Therefore, underwater noise impacts from G&G surveys are expected to be short-term and minor.

MEC/UXO clearance noise: As detailed in the COP, Section 3.3.3.4 (Sunrise Wind 2023), prior to seafloor preparation, cable routing, and micro-siting of all assets, Sunrise Wind would implement a MEC/UXO Risk Assessment with RARMS designed to evaluate and reduce risk in accordance with the As Low as Reasonably Practical (ALARP) risk mitigation principle. During Project construction, the likelihood of MEC/UXO encounters with sea turtles is very low due to low sea turtle presence in the proposed Project Area and monitoring and mitigation.

For all MEC/UXO clearance methods, mitigation measures include the use of noise attenuation to achieve a 10 dB reduction in sound levels, PSOs, pre-survey clearance monitoring, and the establishment of exclusion zones in which sound sources would be shut down when sea turtles are present (Appendix H). Pre-clearance zones would be monitored for 60 minutes prior to blasting, with clearance zones described in Table 3.12-5.

Table 3.12-5. Mitigation and Monitoring Zones Associated with Unmitigated UXO Detonation of Binned Charge Weights

Species	UXO 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)	Pre-Start Clearance Zone[2] (m)	Pre-Start Clearance Zone[2] (m)	Pre-Start Clearance Zone[2] (m)	Pre-Start Clearance Zone[2] (m)
Sea turtles	104	241	545	1,030	1,390

Source: Adapted from Protected Species Mitigation and Monitoring Plan dated July 2022 (LGL Ecological Research Associates 2022).

Notes: kg = kilograms; m = meters; PK = peak pressure level; SEL = sound exposure level.

[1] UXO 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). Four project sites (S1-S4) were chosen and modeled (see Hannay and Zykov (2022), Appendix C [Project Design Envelope and Maximum-Case Scenario]) 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) for marine mammals and the largest distance to the Permanent Threshold Shift (PTS) threshold for sea turtles. Auditory injury thresholds (PTS PK or SEL noise metrics) were larger than modeled distances to mortality and non-auditory injury criteria. The chosen values were the most conservative per charge weight bin across each of the four modeled sites.

Because the potential for effects from MEC/UXO clearance is extremely unlikely but, if required, could result in injury of a very low number of individuals, the effects to sea turtles would be negligible to minor and short-term.

Impact pile driving noise: Underwater noise generated by impact pile driving is considered one of the predominant IPFs that could result in potential physiological and behavioral impacts on sea turtles due to the relatively high source levels produced by impact pile driving and the large distances over which the noise is predicted to propagate. Up to 94 WTG foundations and 1 OCS-DC foundation with four legs would be installed. The typical SRWF WTG foundation pile installation would require approximately 4 to 6 hours of impact pile driving to a final embedment depth of 164 ft (50 m) below the seafloor, with some difficult installations potentially taking up to 12 hours to install due to more difficult substrate conditions. After installation, the WTG would be placed on top of the foundation pile and the vessels would be repositioned to the next site. Between 1 and 3 WTG monopile foundations may be installed per day. For the OCS-DC foundation, the jacket foundation would be placed first, with the pin pile placed through the jacket and driven to its penetration depth (295 ft [90 m]). Pile driving for a single jacket foundation may take up to 48 hours (see Section 3.3.5.2 in COP, Sunrise Wind 2023). Because separate vessels are anticipated to be used for WTG and OCS-DC foundation installations, these activities may occur concurrently.

The potential significance of impulsive underwater noise is unclear because sea turtle sensitivity and behavioral responses to underwater noise are a subject of ongoing study. Potential behavioral impacts may include altered submergence patterns, short-term disturbance, startle response (diving or swimming away), and short-term displacement of feeding/migrating and a temporary stress response, if present within the ensonified area (NSF and USGS 2011; Samuel et al. 2005). The accumulated stress and energetic costs of avoiding repeated exposure to pile-driving noise over a season or a life stage could have long-term impacts on survival and fitness (DoN 2018). Conversely, sea turtles could become habituated to repeated noise exposure over time and not suffer long-term consequences (O'Hara and Wilcox 1990). This type of noise habituation was demonstrated even when repeated exposures were separated by several days (Bartol and Bartol 2011; DoN 2018).

Sea turtles migrating through the area when pile driving occurs are expected to adjust their course to avoid the area where received SPL is elevated above 175 dB re 1 µPa. Depending on how close the species is to the pile being driven, this could involve swimming up to 1.04 mi (1.68 km) (Sunrise Wind 2023). Such behavioral alterations could cause turtles to cease foraging or expend additional effort and energy avoiding the area. Presumably, turtles could continue foraging activities outside the area of elevated noise levels as adjacent habitat provides similar foraging opportunities. The turtle may experience physiological stress during this avoidance behavior, but this stressed state is anticipated to dissipate over time once the sea turtle is outside the ensonified area. There have been no documented sea turtle mortalities associated with pile driving. Either a short-term or permanent reduction in hearing sensitivity could be harmful for sea turtles, but the potential significance is unclear because the role that hearing plays in sea turtle survival (e.g., for predator avoidance, prey capture, and navigation) is poorly understood (NSF and USGS 2011). The use of PSOs, exclusion and monitoring zones, and pile driving soft-start measures (Table H-1, Appendix H) mitigates the risk of sea turtle exposure to elevated underwater noise levels. Because behavioral effects only last for the duration of active pile driving these effects are expected to last a short time, and sea turtles would return to normal behavior once outside of the harassment area or when pile driving stops (BOEM 2021).

Sea turtles that are close to impact pile driving could experience a temporary or permanent loss of hearing sensitivity. In theory, reduced hearing sensitivity could limit the ability to detect predators and

prey or find potential mates, reducing the survival and fitness of affected individuals; however, the role and importance of hearing in these biological functions for sea turtles remain poorly understood (Lavender et al. 2014).

Modeling of sea turtle exposures was done for a range of potential construction scenarios as described in Section 4.4.2 COP Appendix I1 (Küsel et al. 2022). BOEM has adopted a conservative approach of using the highest values for each analyzed criteria from among all five modeled scenarios. As described in Küsel et al. (2022), up to five leatherback sea turtles may experience TTS or PTS injury, while Kemp's ridley, green, and loggerhead sea turtles are expected to have less than one injury from impact pile driving each (Table 3.12-6). Up to 10 leatherback and 10 loggerhead sea turtles may experience behavioral harassment from impact pile driving, while Kemp's ridley and green sea turtles are expected to have less than one incident of behavioral harassment each. These estimates are maximum exposures based on density estimates and exposure ranges, and do not account for mitigation efforts related to observers or shutdown zones. A full description of the acoustic analysis of sea turtle exposures is contained in COP Appendix I1 (Küsel et al. 2022).

Table 3.12-6. Maximum Estimated Sea Turtle Exposures among All Modeled Construction Schedule Scenarios for WTG and OCS-DC Foundation Installation via Impact Pile Driving, Assuming A Minimum of 10 dB of Sound Attenuation

Species	Injury		Behavior
	L_E	L_{pk}	L_p
Kemp's ridley turtle	0.05	0	0.31
Leatherback turtle	4.30	0	9.57
Loggerhead turtle	0.50	0	9.30
Green turtle	0.10	0	0.29

Source: Küsel et al 2022, Tables 4.4-12 through 4.4-16.

As described in Appendix H (*Mitigation and Monitoring*), additional protection measures include noise attenuation technologies, soft starts for pile driving, the use of trained 6-8 PSOs for monopile installation, a 500- pre-clearance and exclusion zone for sea turtles, reduced visibility monitoring tools, adaptive vessel speed reductions, and utilization of software to share visual and acoustic detection data between platforms in real time. PSOs would perform pre-clearance monitoring of the area surrounding the construction site for 60 minutes prior to beginning pile driving. PSOs would also enforce shutdown zones when sea turtles are observed within the shutdown zones. Pile driving would not resume until individuals have left the shutdown zone of their own volition, and no turtles have been observed within the shutdown zone for at least 60 minutes. These measures are likely to reduce the risk of injury or exposure to sea turtles during daylight hours but are not expected to reduce risk for sea turtles during any nighttime pile driving.

Based on the combination of minimization measures mentioned above (e.g., sound reduction technology, soft starts, PSOs) and the low numbers of sea turtles expected in the SRWF and SRWEC, impacts to sea turtles from impact pile driving would be short-term and minor.

Vibratory pile driving noise: Vibratory pile driving may be used during the construction phase of the SRWF for cofferdam installation at the export cable landing. Sea turtles may experience behavioral effects for received SPLs above 175 dB re 1 µPa. Vibratory noise levels are typically lower than for impact pile driving. Because of this, the radius at which behavioral impacts can be expected for sea turtles is less than 10 ft using the NMFS Multispecies Pile Driving Calculator (Version 1.1, *NMFS Protected Species Division, Silver Spring, Maryland*). As shown in Table 3.12-3, vibratory pile-driving noise is not expected to exceed behavioral thresholds (Küsel et al. 2022).

Monitoring and mitigation for vibratory pile installation includes the use of two PSOs, pre-clearance and shutdown zones, and ramp-up procedures during days with decrease visibility of the shutdown zone. The pre-clearance and shutdown zone would be 500 m for all sea turtles. The PSO would halt pile driving if an individual enters the shutdown zone, and pile driving would not resume until the individual has left the shutdown zone and no individuals have been observed for at least 15 minutes (dolphins, porpoises, and seals) or 30 minutes (whales). Appendix H describes the monitoring and mitigation for vibratory pile driving in further detail.

Given the limited spatial extent of these potential effects, the minimization measures required, low densities of sea turtles in the SRWF and SRWEC, and short duration of pile-driving activities, the impacts from vibratory pile driving to sea turtles would be negligible.

Vessel noise: The relatively low-frequency range of turtle hearing (100–1,200 Hz) (Ketten and Moein Bartol 2006; Lavender et al. 2014) overlaps the broad frequency spectrum of intermittent non-impulsive noise produced by vessels (10-1,000 Hz). Sea turtles could respond to vessel approach and/or noise with a startle response and a short-term stress response (NSF and USGS 2011); however, Hazel et al. (2007) suggested that turtles could habituate to vessel sounds in marine areas that experience regular vessel traffic. This could reduce the behavioral impacts of vessel noise but may increase the potential for vessel collision (refer to subsection on vessel traffic below). Underwater noise generated by construction vessels would not exceed injury thresholds for turtles, as noise levels produced by vessels in general are below levels that could cause potential auditory threshold shifts. Behavioral responses to vessels have been reported but are thought to be more associated with visual cues, as opposed to auditory cues (Hazel et al. 2007), although both senses likely play a role in avoidance. A conservative assumption is that construction and support vessels could elicit behavioral changes in individual sea turtles near the vessels. It is assumed that these behavioral changes would be limited to evasive maneuvers such as diving, changes in swimming direction, or changes in swimming speed to distance themselves from vessels. Overall, impacts to sea turtles from vessel noise would be negligible.

Aircraft noise: Fixed-wing aircraft may be used during construction for marine mammal monitoring, and helicopters may be used for crew transport to and from construction vessels. Monitoring aircraft would operate at an altitude of 1,000 ft (300 m) consistent with established guidance. Noise from crew transport helicopters would increase during approach and departure from vessel landing pads. Currently, no published studies describe the impacts of aircraft overflights on sea turtles, although anecdotal reports indicate that sea turtles respond to aircraft by diving (BOEM 2017). While helicopter traffic may cause some short-term and short-term nonbiologically significant behavioral reactions, including startle responses (diving or swimming away), altered submergence patterns, and a short-term stress response (BOEM 2017; NSF and USGS 2011; Samuel et al. 2005), these brief responses are expected to dissipate

once the aircraft leaves the area. Operating aircraft are anticipated to be close enough to the water surface to incur behavioral effects only on the order of minutes and only associated with takeoffs and landings. Combined with the relatively low number of aircraft operations, the potential effects of aircraft noise and disturbance on sea turtles are, therefore, expected to be negligible.

EMF: Because EMFs are generated by power production when WTGs are operating, no effects from the IPF are expected during construction of the offshore facilities.

Accidental releases – contaminants: During construction of the SRWF, there could be a short-term risk of sanitary and other waste fluids or fuels and other petrochemicals accidentally entering the water. If sea turtles were to be exposed to an oil spill or a discharge of waste material, studies indicate that respiration, skin, some aspects of blood chemistry and composition, and salt gland function could be significantly impacted in exposed species (Vargo 1986). Any non-routine spills or accidental releases that could result in negligible and short-term impacts to surface-water resources would be avoided or minimized through the implementation of the proposed Project SPCC Plan and other APMs (refer to Appendix H). Impacts on sea turtles from accidental spills or releases of pollutants are considered negligible because of the low probability of the risk and APM implementation.

Accidental releases – trash and debris: Trash and debris that enter the water represent a risk factor to sea turtles because the turtles could ingest or become entangled in debris, causing lethal or injurious impacts. Pollution (e.g., plastic) is often mistaken for food such as jellyfish and ingested, which can block intestinal tracts, causing injury or mortality. Section 3.12.3 provides additional debris and entanglement information. Personnel working offshore would receive training on sea turtle and marine debris awareness. Impacts on sea turtles from accidental deposits of trash or debris associated with the proposed Project would be minor because implementation of proposed APMs (Table H-1, Appendix H) lowers the probability of such risk.

Vessel traffic: Increased vessel activity in the Project Area associated with the Construction and Installation phase of the Proposed Action pose a risk of increased collision-related injury and mortality for sea turtles. Risk of collision injury is commensurate with vessel speed. The probability of a vessel strike increases significantly as speeds increase above 10 knots (Conn and Silber 2013; Kite-Powell et al. 2007; Laist et al. 2001; Vanderlaan and Taggart 2007). Propeller and collision injuries from boats and ships are common in sea turtles and an identified source of mortality (Hazel et al. 2007; Shimada et al. 2017). Hazel et al. (2007) also reported that individuals may become habituated to repeated exposures over time that were not accompanied by an overt threat. Project construction vessels could collide with sea turtles, posing a short-term increase in the risk of injury or death to individual sea turtles.

Sea turtles are likely to be most susceptible to vessel collision in coastal foraging areas crossed by construction vessels traveling between the SRWF and offshore SRWEC and area ports. Hazel et al. (2007) indicated that sea turtles may not be able to avoid being struck by vessels at speeds exceeding 2 knots, and collision risk increases with increasing vessel speed. Habituation to noise may also increase the risk of vessel collision; however, avoidance behaviors observed suggest that a turtle's ability to detect an approaching vessel is more dependent on vision than sound although both may play a role in eliciting behavioral responses. Construction vessel speeds could periodically exceed 10 knots during transits to and from area ports, posing an incremental increase in collision risk relative to baseline levels of vessel traffic. During construction, vessels generally either remain stationary when installing the monopiles and

WTG/OSS equipment or move slowly (i.e., at less than 10 knots) when traveling between foundation locations. Cable-laying vessels move slowly on the order of 1 mile per day.

Sea turtles are vulnerable to a range of vessel types depending on the environment. Large vessels used during Proposed Action construction would likely include one cable-laying vessel, one rock-dumping vessel, one jack-up barge, six material and feeder barges and four tow tugs, one work vessel, and one fuel bunkering vessel. Similar vessels would be used during decommissioning. These vessels would largely remain on station or travel at speeds well below 10 knots during construction and decommissioning of the SRWF and SRWEC, reducing the risk of vessel strike.

Other vessels used during construction and decommissioning would include crew transports and inflatable support vessels used for PSO monitoring. Two crew transport vessels would be used during operation. These vessels would adhere to speed restrictions and other mitigation measures outlined elsewhere in this document and, in general, are smaller and more maneuverable and better able to avoid collisions with protected species when combined with observers. For this reason, these vessels would pose a minimal risk of collision with sea turtles.

Based on information provided by Sunrise Wind, Project construction would require an estimated total of 1,575 vessel trips between SRWF and ports in Rhode Island, Massachusetts, Connecticut, and New York over the 2-year construction period, with an estimated maximum of nine trips in any given month from U.S. ports outside of the Rhode Island/Massachusetts WEAs. Port traffic within the Rhode Island/Massachusetts WEAs would add an additional 127 one-way trips during WTG installation and 146 one-way trips during cable installation to the SRWF. The construction vessels used for Project construction are described in Table 3.11-15. Typical large construction vessels used in this type of project range from 325 to 350 ft (99 to 107 m) in length, 60 to 100 ft (18 to 30 m) in beam, and draft from 16 to 20 ft (5 to 6 m) (Sunrise Wind 2023). All project vessels operating between local ports and the Project Area would be required to comply with the mitigation described in the PSMMP.

During construction, an estimated 924 vessel trips per year would cross transects 24 through 27 when transiting to and from SRWF (DNV-GL 2022). This would equate to a 64 percent increase in vessel traffic within the SRWF area; however, the Automatic Identification System (AIS) data used in transect analysis do not include many recreational vessels that lack AIS transponders and commercial fishing vessels that deactivate their transponders when actively fishing. These two vessel classes account for the vast majority of vessel activity. For example, Sunrise Wind estimated 19,611 one-way trips per year by commercial fishing vessels between the SRWF and area ports (DNV-GL 2022). When commercial fishing vessel trips are included, Project construction and installation would result in a 4.4 percent increase in vessel transits per year across transects 24 through 27 during the construction and installation phase. In summary, this assessment indicates that construction and installation vessels would likely increase vessel traffic to some degree over baseline conditions. This indicates the potential for increased risk of sea turtle collisions, but that risk is mitigated in part by typical vessel speeds during construction and installation, low relative increase in vessel traffic, and by proposed risk avoidance and minimization measures.

It is anticipated that the risk of vessel strike on ESA-listed species is negligible because of the nature of construction and planned mitigation measures which include vessel strike avoidance measures. The Applicant has committed to a range of EPMs to avoid vessel collisions with sea turtles (see Appendix H).

BOEM would also require additional mitigation measures to avoid and minimize impacts to ESA-listed species. These include strict adherence to NOAA guidance for collision avoidance and a combination of additional measures, including speed restrictions to 10 knots or less for all vessels at all times between November 1 and April 30 and in all North Atlantic right whale (NARW) Dynamic Management Areas. All vessel crews would receive training to ensure that these EPMs are fully implemented for vessels in transit. Once on station, construction vessels either remain stationary when installing the monopiles and WTG/OSS equipment or move slowly (i.e., at less than 10 kt) when traveling between foundation locations. Cable-laying vessels move very slowly at approximately 1 mi per day. Planned mitigation measures, including voluntary speed restrictions and use of PSOs, would effectively limit collision risk when traveling to and from area ports.

Project EPMs and mitigation measures include the implementation of NOAA vessel guidelines for sea turtle strike avoidance measures, including vessel speed restrictions. These measures are intended to minimize the risk of vessel strikes; however, the likelihood of sea turtle injury or mortality resulting from Project-related vessel strikes over the 2-year construction and installation period cannot be discounted. Green, loggerhead, and Kemp's ridley sea turtle populations have generally been increasing over the past few decades, while leatherback sea turtle populations have declined. Because the abundance of sea turtles in the Project Area is anticipated to be generally low with patchy distribution, and the proportional increase in vessel traffic also low, the number of sea turtles injured or killed by vessel strikes as a result of Project construction is expected be low and would not result in significant effects at the population level. Therefore, the potential for construction vessel collisions on sea turtles would result in short-term minor adverse impacts.

Fishing vessels may be displaced during construction of WTGs and installation of the SRWEC. Up to 300 fishing vessels use the SRWF annually (Section 3.14 *Commercial Fisheries and For-Hire Recreation*) and might decide to avoid the SRWF once it is fully constructed. Potential for displacement of fishing vessels during SRWF operations is discussed further below under Section 3.12.5.3, *Operations and Maintenance and Conceptual Decommissioning*. The increased collision risk in some areas is anticipated to be commensurate with the decreased risk within the SRWF, so changes in collision risk from relocated commercial and for-hire fishing vessels during construction of the SRWF would not be measurable from baseline. Relocation of fishing vessels during construction and installation is considered to have negligible adverse impacts to sea turtles.

Gear utilization: The FBRMP for the Proposed Action has been developed in accordance with recommendations set forth in *Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf* (BOEM 2019c). BOEM provides guidance related to specific survey gears that can be used to complete the fisheries monitoring including otter trawl, beam trawl, acoustic telemetry stations, towed or autonomous PAM platforms, and ROVs. BOEM guidelines stipulate that 2 years of pre-construction monitoring data are recommended, and that data should be collected across all four seasons. Consultations with BOEM and other agencies are encouraged during the development of fisheries monitoring plans.

The FBRMP may occur throughout any of the phases of the Proposed Action. The FBRMP would be revised through an iterative process, and survey protocols and methodologies have been and would continue to be refined and updated based on feedback received from stakeholder groups. Much of the

research described in this plan would be performed on commercial fishing vessels that are contracted for this monitoring. Further, the field work described in the monitoring plan would be performed by an independent contractor (e.g., local university, research institution, or consulting firm). Chapter 2 describes the proposed activities in detail. Effects of Project vessels, including the ones that would be used for survey and monitoring activities are considered above.

Any sampling that utilizes gear that may pose a risk to turtle species, including gillnet sampling, could be potentially hazardous to some vulnerable species. All sampling efforts would follow included BMPs to limit capture and entanglement risk.

The lessee must ensure that any buoys attached to the seafloor use buoys, lines (chains, cables, or coated rope systems), swivels, shackles, and anchor designs that prevent any potential entanglement of listed species while ensuring the safety and integrity of the structure or device. All mooring lines and ancillary attachment lines must use one or more of the following measures to reduce entanglement risk: shortest practicable line length, rubber sleeves, weak links, chains, cables, or similar equipment types that prevent lines from looping, wrapping, or entrapping protected species. Any equipment must be attached by a line within a rubber sleeve for rigidity. The length of the line must be as short as necessary to meet its intended purpose. All buoys must be properly labeled with lessee and contact information.

Trawl surveys: The capture and mortality of sea turtles in bottom-trawl fisheries is well documented (Henwood and Stuntz 1987; NMFS and USFWS 1991a, 1992, 2008; National Research Council 1990). NOAA has prioritized reduction of sea turtle interactions with fisheries where these species occur. Finkbeiner et al. (2011) compiled sea turtle bycatch in U.S. fisheries and found that in the Atlantic, a mean estimate of 137,700 interactions, of which 4,500 were lethal, occurred annually since the implementation of bycatch mitigation measures; however, a vast majority of the interactions (98 percent) and mortalities (80 percent) occurred in the Southeast/Gulf of Mexico shrimp trawl fishery, although sampling inconsistencies and limitations should be considered when interpreting this data (NMFS 2014).

While sea turtles are capable of remaining submerged for long periods of time, they appear to rapidly consume oxygen stores when entangled and forcibly submerged in fishing gear (Lutcavage and Lutz 1997); however, the preponderance of available research (Epperly et al. 2002; Sasso and Epperly 2006) and anecdotal information from past trawl surveys indicates that limiting tow times to less than 30 minutes would likely eliminate the risk of death for incidentally captured sea turtles. The proposed trawls would be limited to 20 minutes of tow time. The tow begins when winches are locked and an acceptable net geometry is established. The relatively short tow duration is expected to minimize the potential for interactions with sea turtles and pose a negligible risk of mortality. The proposed mitigation measures would be expected to eliminate the risk of serious injury and mortality from forced submergence for sea turtles caught in the bottom otter trawl survey gear. While mortality is expected to be unlikely from either proposed otter trawl surveys, incidentally captured individuals would suffer stress and potential injury. Where possible, turtles are disentangled and if injured, may be brought back to rehabilitation facilities for treatment and recovery. This helps to reduce the rate of death from entanglement. We expect that incidental capture and entanglement of sea turtles would continue in the action area at a similar rate over the life of the Proposed Action. Safe release, disentanglement

protocols, and rehabilitation would help to reduce the severity of impacts of these interactions and these efforts are also expected to continue over the life of the project.

SRWF intends to conduct 180 surveys per year using the same methods and gear as the Northeast Area Monitoring and Assessment Program (NEAMAP) surveys, with 20 minutes per tow. Surveys may be conducted during the 2 years of construction and up to 6 additional years. We then apply the capture rates (Table 3.12-7) to the planned surveys to estimate the number of sea turtles that are likely to be captured during trawl surveys (Table 3.12-8).

Table 3.12-7. Sea Turtle Capture Data and Capture Rates in Northeast Fisheries Science Center-affiliated Research from 2004 through 2013 Reported in Turtles per Tow Hour (t/t-h) and per Tow

Survey	Loggerhead Capture Rate	Kemp's Ridley Capture Rate	Green Capture Rate	Leatherback Capture Rate
NEAMAP – Spring (150 tows/year @ 20 minutes/ tow x 10 year = 500 t-h)	0.014 t/t-h (0.0047/tow)	0	0	0
NEAMAP – Fall (150 tows/year @ 20 minutes/ tow x 10 year = 500 t-h)	0.01 t/t-h (0.0033/tow)	0.016 t/t-h (0.0053 per tow)	0.002 t/t-h (0.0007/tow)	0

Source: NMFS 2016a
NEAMAP = Northeast Area Monitoring and Assessment Program surveys

Table 3.12-8. Estimated Trawl Captures from Surveys Associated with the Sunrise Wind Farm

	Estimated Loggerhead Captures	Estimated Kemp's Ridley Captures	Estimated Green Captures	Estimated Leatherback Captures
Per Year	6.72	7.68	0.96	0
Total (8 Years)	53.76	61.44	7.68	0

Source: NMFS 2016a

Extensive trawl surveys in the region have indicated that leatherback sea turtles are extremely unlikely to be captured during trawl surveys (NMFS 2016a). Therefore, trawl surveys are expected to have a negligible adverse impact to leatherback sea turtles.

Green, loggerhead, and Kemp's ridley sea turtles may be captured during trawl surveys, and capture would cause stress and may result in injury, and in rare cases, post capture mortality. However, most turtles experience no injury or only minor injuries, and mortality occurs only in a small portion of incidental captures (NMFS 2016a). Because of this, while individuals would experience harassment and injury, and a small number of turtles may be killed, no population-level effects are expected for these

species. Trawl surveys would result in minor adverse impacts to green, loggerhead, and Kemp's ridley sea turtles.

Passive Acoustic Monitoring surveys: The use of PAM buoys or autonomous PAM devices to monitor noise, marine mammals, passive acoustic telemetry tags, and the use of sound attenuation devices placed on the seafloor for mitigation during pile driving have been proposed by Sunrise Wind (Sunrise Wind 2023).

Based on previous consultations, BOEM anticipates requiring that moored and autonomous PAM systems that may be used for monitoring would either be stationary (e.g., moored) or mobile (e.g., towed, autonomous surface vehicles [ASVs], or autonomous underwater vehicles [AUVs]), respectively. Moored PAM systems would use the best available technology to reduce any potential risks of entanglement. PAM system deployment would follow the same procedures as those described in the previous section to avoid and minimize impacts on ESA-listed species, as detailed in Appendices AA1 and AA2 of the COP (Sunrise Wind 2023). The use of buoys for moored PAM systems, or any other intended purposes, would pose a discountable risk of entanglement to listed sea turtles.

Autonomous PAM systems could have hydrophone equipment attached that operates autonomously in a defined area. ASVs and AUVs in very shallow water can be operated remotely from a vessel or by line of sight from shore by an operator and in an unmanned mode. These autonomous systems are typically very small, lightweight vessels and travel at slow speeds. ASVs and AUVs produce virtually no self-generated noise and pose a negligible risk of injury to sea turtles from collisions due to their low mass, small size, and slow operational speeds. ASVs and AUVs are not expected to pose any reasonable risk of harm to listed species; therefore, the impacts of this type of survey equipment on sea turtles are negligible.

Gear utilization and fisheries survey impacts to prey: Fisheries surveys are designed not to have measurable impacts to surveyed resources and are not anticipated to have any measurable impact on prey availability for sea turtles. All FBRMP survey efforts would affect only extremely small areas relative to available habitat in the Project area. All bycatch is expected to be returned to the water alive, dead, or injured to the extent that the organisms would shortly die. Injured or deceased bycatch would still be available as prey for sea turtles, particularly loggerhead sea turtles, which are known to eat a variety of live prey as well as scavenge dead organisms. Given this information, any impacts on sea turtles from collection of potential sea turtle prey in the trap gear would be so small that they cannot be meaningfully measured, detected, or evaluated and would be negligible.

Lighting: Lights are required on vessels and heavy equipment during construction. Most scientific studies on lighting effects on sea turtles were conducted at nesting sites, which do not occur in the SRWF and SRWEC. Gless et al. (2008) reported that previous studies showed that previous studies showed that loggerhead turtles were attracted to lights from longline fishing vessels. Gless et al. (2008) conducted a laboratory study to see if juvenile leatherbacks responded to lights in the same way as loggerheads. Their study showed that leatherbacks either failed to orient or oriented at an angle away from the lights and concluded that there is no convincing evidence that marine turtles are attracted to vessel lights. Limpus (2006) indicates that navigation/anchor lights on top of vessel masts are not impactful but that bright deck lights should be shielded, if possible, to reduce impacts to sea turtles. If sea turtles are

attracted to the lights, it could increase the potential for interaction with equipment or associated Project impacts. However, due to the nature of Project activities and associated seafloor disturbance, turbidity, and noise, listed species and their prey are not likely to be attracted by lighting because they are disturbed by these other factors. Project APMs (Table H-1, Appendix H) include construction vessel light shielding and operational restrictions to limit light use to required periods and minimize artificial lighting effects on the environment. Considering the APMs and the fact that construction vessel activity is unlikely to measurably alter baseline vessel light levels, construction lighting effects on sea turtles would be negligible.

3.12.5.2 Operations and Maintenance

3.12.5.2.1 Onshore Activities and Facilities

No regular sea turtle nesting occurs in the onshore portion of the proposed Project Area (refer to Section 3.12.1). Construction and operation of onshore facilities is not expected to have any direct impacts to sea turtles, and the potential for impacts is negligible.

3.12.5.2.2 Offshore Activities and Facilities

During O&M, impacts to sea turtles could occur from the following IPFs: seafloor disturbance, sediment suspension and deposition, noise, electric and magnetic fields, discharges and release, trash and debris, vessel traffic, and lighting, and visible structures. Unless noted otherwise, O&M-related impacts would be long-term. The potential for these impacts to occur are discussed in detail in the following sections.

Seafloor disturbance: Impacts to sea turtles from seafloor disturbance during O&M of the proposed Project would be limited to the impacts expected on their benthic prey. Seafloor-disturbing activities during O&M of the SRWEC-OCS and NYS are only expected during non-routine maintenance that may require uncovering and reburying the cables and/or the maintenance of the cable protection. These O&M activities are expected to result in similar impacts on benthic resources as those discussed for the SRWF and could therefore temporarily displace sea turtles due to decreased available forage; however, the extent of disturbance would be limited to specific areas along the SRWEC cable corridor centerline and the footprint of the SRWEC is relatively small when compared to the ample surrounding available benthic/prey habitat. Overall impacts of O&M activities would be negligible for sea turtles.

Sediment suspension and deposition: Any maintenance activities that requires exposing and reburying the IAC, and the use of vessel anchoring and jack-up may result in increases in sediment suspension and deposition, which may temporarily increase turbidity in the water column. These activities are expected to be non-routine events and are not expected to occur with any regularity. As discussed for the construction phase, sediment suspension and deposition could result in very short-term reductions in availability or detectability of sea turtle prey species and would have negligible impacts on prey species targeted for consumption by sea turtles in the SRWF and the overall foraging success of sea turtles.

Noise: Direct impacts to sea turtles associated with noise during O&M of the SRWEC may result from G&G Surveys and support vessel and aircraft noise during routine and non-routine maintenance trips

and as a result of G&G surveys. Operational noise of wind turbines would not reach levels that could result in behavioral effects to sea turtles.

G&G survey noise: Throughout the proposed operational life of the SRWEC, Sunrise Wind expects to use a variety of vessels to support O&M, including SOVs with deployable work boats (daughter craft), CTVs, jack-up vessels, and cable-laying vessels. Project vessels would undergo routine maintenance trips between potential ports in New York and Rhode Island and the SRWEC. Noise impacts from vessel use during O&M would be similar to those described for construction. Individual sea turtles may experience direct, short-term, reversible behavioral disruptions due to the incremental and transient contribution of O&M vessels. G&G surveys performed during O&M would adhere to the same mitigation requirements described above for construction and installation and detailed in Appendix H. The limited nature of these effects and number of individuals affected would not be significant at stock or population levels. On this basis, the effects of G&G noise on sea turtles would be short-term and minor.

Vessel noise: During the O&M phase, maintenance vessels would intermittently be required to service the WTGs and OCS-DC. Additionally, recreational and commercial fishing vessel traffic is likely to increase near WTG foundations. Sea turtles have hearing abilities limited to low frequencies, and no injury or behavioral effects from vessel noise are anticipated for planned offshore wind projects. Although sea turtles could become habituated to repeated noise exposure over time (Hazel et al. 2007), vessel noise effects from the Proposed Action to be broadly similar to noise levels from existing vessel traffic in the region. Nonetheless, periodic localized, intermittent, and short-term behavioral impacts on sea turtles could occur. Based on sea turtle responses to other types of disturbance (e.g., Bevan et al. 2018), turtle behavior is expected to return to normal when vessel noise dissipates. Given limited turtle sensitivity to underwater noise produced by vessels, the short-term nature of any behavioral responses, and the patchy distribution of sea turtles in the GAA, the effects of vessel noise from vessel activities during O&M on sea turtles would be negligible.

Aircraft noise: Sunrise Wind expects to use a hoist-equipped helicopter, and unmanned aircraft systems may also be used to support O&M. The type and number of vessels and helicopters would vary over the operational lifetime of the Project. Impacts from aircraft use during O&M would be similar to those described for construction and would have negligible impacts on sea turtles.

WTG operation noise: WTG operation is another source of continuous noise but is not expected to result in biologically significant effects on sea turtles. According to measurements at the Block Island Wind Farm, low-frequency noise generated by turbines reach ambient levels at 164 ft (50 m) (Miller and Potty 2017). Other studies observed noise levels ranging from 109 to 127 dB re 1 µPa at 46 and 65.6 ft (14 and 20 m), respectively, at operational wind farms (Tougaard et al. 2020). Operational noise and ambient noise both increase in conjunction with wind speed, meaning that WTG noise is only audible within a short distance from the source (Kraus et al. 2016; Thomsen et al. 2015). Additionally, SRWF turbines would be direct drive turbines, which result in less WTG noise in the underwater environment. It is not expected that noise from WTG operation would approach or exceed the behavioral threshold for sea turtles. Therefore, operational noise from the Proposed Action would be negligible.

EMF: The proposed Project would consist of two offshore electric transmission systems: 180 mi (290 km) of 161 kilovolt (kV) AC IAC and up to 104.6 mi (168.4 km) of 320 kV direct current Sunrise Wind export cables (SRWEC). These effects would be most intense at locations where the SRWEC cannot be buried

and is laid on the bed surface covered by a stone or concrete armoring blanket. Up to 15 percent of the IAC (27 mi [43.45 km]) and up to 5 percent of the SRWEC (5.2 mi [8.4 km]) could require secondary cable protection (including jointing, but not including cable crossings). Exponent Engineering, P.C. (2022) modeled anticipated EMF levels generated by the SRWEC and IAC. It estimated induced magnetic field levels ranging from 13.7 to 76.6 mG on the bed surface above the buried and exposed SRWEC cable and 9.1 to 65.3 mG above the IAC. Induced field strength would effectively decrease to 0 mG within 25 ft (7.6 m) of each cable.

Normandeau et al. (2011) indicate that sea turtles are magnetosensitive and orient to the earth's magnetic field for navigation, but they are unlikely to detect magnetic fields below 50 mG. The majority of SRWEC and IAC would be buried 4 to 6 ft (1.2 to 1.8 m) below the bed surface, reducing the magnetic field in the water column below levels detectable to turtles. The transmission cables could produce magnetic field effects above the 50-mG threshold at selected locations where full burial is not possible; these areas would be localized and limited in extent. Magnetic field strength at these locations would decrease rapidly with distance from the cable and drop to 0 mG within 25 ft (7.6 m). Peak magnetic field strength is below the theoretical 50-mG detection limit along the majority of cable length, only exceeding this threshold above the short-cable segments laid on the bed surface. Those EMF effects would dissipate below the 50-mG threshold within 1 to 2 ft (0.3 to 0.6 m) of the cable surface. This indicates that turtles would only be able to detect induced magnetic fields within 1 to 2 ft (0.3 to 0.6 m) of cable segments lying on the bed surface. These cable segments would be relatively short (less than 100 ft [30 m]) and widely dispersed. Exponent Engineering, P.C. (2022) concluded that the shielding provided by burial and the grounded metallic sheaths around the cables would effectively eliminate any induced electrical field effects detectable to turtles. Given the limited extent of measurable magnetic field levels and limited potential for mobile species like sea turtles to encounter field levels above detectable thresholds, the effects of Project-related EMF exposure on sea turtles would be negligible.

Entrainment: Seawater cooling is needed for the OCS– DC (see Section 3.3.6.1 in COP; Sunrise Wind 2023). During operation, the OCS-DC would require continuous cooling water withdrawals and subsequent discharge of heated effluent back to the receiving waters. The maximum DIF and discharge volume is 8.1 million gallons per day with actual intake flow and discharge volumes that are dependent on ambient source water temperature and facility output. Preliminary hydrodynamic modeling indicates that there would be some highly localized increases in water temperature in the immediate vicinity of the discharge location of the OCS-DC. The design, configuration, and operation of the CWIS for the OCS-DC would be permitted as part of an individual NPDES permit and additional details would be included in the permit application submitted to the USEPA. This would include final results of the hydrodynamic modeling.

The OCS-DC would include three openings for intake pipes located approximately 30 ft (10 m) above the pre-installation seafloor grade. The water depth of the intake pipe openings was selected to minimize the potential of biofouling and entrainment of ichthyoplankton and to take advantage of the cooler water temperatures found at depth to maximize cooling potential of water withdrawn. The design intake velocity at the intake screens is less than 0.5 ft/s (less than 15.25 cm/s). This intake velocity estimate is below the threshold required for new facilities defined at 40 *CFR* §125.84(c) and is therefore protective against the impingement of juvenile and adult life stages of sea turtles.

Because of the included intake screens and relatively low intake velocities, sea turtles are not expected to be at risk for entrainment. Due to the extremely localized nature of temperature effects from cooling water discharge, the potential for impacts to sea turtles would be insignificant. Because sea turtles, at the sizes and life stages that may be present in the area are not expected to be at risk for entrainment, this effect is extremely unlikely to occur and would have negligible impact.

Impacts to prey species: A number of mitigation measures included in the design of the OCS-DC would reduce impacts to sea turtle prey species. The low screen velocity would prevent impingement of mobile prey species. The hydraulic zone of influence of the intake does not extend more than 20 ft from the intake (*draft* USEPA NPDES Permit No. MA0004940). Aquatic organisms including eggs and larvae of prey species and macroplanktonic prey species such as jellyfish and salps species would have to pass through this relatively small area in order to be exposed to the influence of the intake and to potentially become impinged or entrained.

The OCS-DC would include three openings for intake pipes located approximately 30 ft (10 m) above the pre-installation seafloor grade. The water depth of the intake pipe openings was selected to minimize the potential of biofouling and entrainment of ichthyoplankton and to take advantage of the cooler water temperatures found at depth to maximize cooling potential of water withdrawn. The location of the intake pipes should reduce entrainment of pelagic and larval life stages.

Additionally, the OCS-DC is designed with VFD pumps to enable the facility to limit the volume of water it withdraws to the amount required to meet cooling water needs. During colder winter months when Atlantic cod spawn, less cooling water is needed. The VFD pumps would allow the intake flow to be throttled back and the actual intake flow would vary between 4.0 and 5.3 mgd as compared to the design flow of 8.1 mgd. The use of VFDs to achieve projected actual intake flows would result in an estimated 47 percent to 49 percent reduction in entrainment (*draft* USEPA NPDES Permit No. MA0004940). At the proposed average monthly intake flows (4.0-5.3 mgd) distributed over two intake pipes, the estimated actual through-screen velocity at the intake is expected to be 0.21 – 0.28 fps. This through-screen velocity is lower than the velocities used in the modeling described below.

To analyze potential prey impacts that may be affected by OCS-DC operations, one representative species of zooplankton was modeled to estimate proportional impact to planktonic species (which includes sea turtle prey species such as jellyfish and salps), as plankton are the most vulnerable to entrainment. *Calanus finmarchicus* is a heavy-bodied, planktonic copepod that is an important prey species for several organisms in the region. Although additional species of zooplankton within the vicinity of the OCS-DC may also be susceptible to entrainment, *C. finmarchicus* was selected as representative due to its trophic importance in the ecosystem. Using the approach described in COP Appendix N2 (TRC 2023), the entrainment of *C. finmarchicus* from the National Centers for Environmental Information density data was estimated to be 1.1 billion organisms annually. For context, assuming an even distribution of this species and an average depth of 148 ft (45 m), the total abundance of *C. finmarchicus* within Lease Area OCS-A 0487 (109,252 ac) would be close to 2 trillion, and the annual entrainment losses would represent less than 0.1 percent of the local population for this zooplankton species. Using the 0.1 percent impact to *C. finmarchicus* as a proxy for planktonic prey species of sea turtles, it is anticipated that this would result in negligible impacts to sea turtle species prey availability.

It is important to note that these potential estimates assume 100 percent mortality of entrained organisms. There is potential that entrained individuals would survive passage through the CWIS due to short residence time in the system and a maximum water temperature exposure of only 90°F (32°C). Entrainment survival studies at existing power plants do not include directly comparable facilities or environments, but Review of Entrainment Survival Studies: 1970–2000 by EPRI identifies 91.4°F (33°C) as an upper threshold discharge temperature for many organisms to survive entrainment in existing power plants located along the Hudson River in New York (TRC 2023). These potential mechanisms for entrainment survival have not yet been applied to this analysis but could be considered when evaluating overall biological impacts of the OCS-DC operation.

Because the total entrained portion of the population of planktonic prey is less than 0.1 percent, the proportion of prey base that may be affected by the operation of the cooling water system is insignificant and, therefore, would result in negligible adverse impacts to sea turtles.

Accidental releases – contaminants: The SRWF would undergo maintenance as needed, which would necessitate vessels and other equipment at the facility for the life of the proposed Project. This presents an opportunity for accidental discharge or spills of fuels and/or fluids during maintenance activities. Spill response APMs (Table H-1, Appendix H) employed during construction would be implemented during maintenance activities. These APMs are expected to avoid or minimize water quality impacts from accidental spills or releases of pollutants during O&M activities. Impacts on sea turtles from accidental spills or releases of pollutants are considered minor and short-term because of the low probability of the risk and APMs (refer to Section 3.5 *Water Quality* for additional details).

Accidental releases – trash and debris: Impacts to sea turtles from disposal of trash and debris during O&M are expected to be similar to, but of lesser likelihood than during construction, as there would be fewer Project-related marine vessels during this phase, and regulatory requirements and preventative measures would still apply. The unanticipated marine disposal of trash and debris is considered an unpermitted, accidental event, and containment and good housekeeping practices would be implemented to minimize the potential.

Indirectly, there may be an increased number of commercial and recreational fishing vessels that operate around the SRWF, which could increase the occurrence of trash and debris from these vessels being released in the SRWF. This could also increase the potential entanglement risk from netted fishing gear, longlines, ropes, traps, or buoy lines. Although unlikely, there would be potential for entanglement or ingestion of line by sea turtles in the vicinity. Adverse impacts incurred from increased fishing activity in the SRWF are not anticipated, but in the event that a line or cable is lost, it could then present a higher risk of sea turtle entanglement. While such entanglements have the potential for a prolonged impact on the individual and may result in mortality, O&M of the SRWF is not expected to directly increase this risk. Therefore, the proposed Project impacts from trash and debris during O&M would be negligible.

Vessel traffic: The potential impacts of vessel traffic are described above in the discussion of potential vessel traffic impacts during construction and installation (Section 3.12.5.1.2). Sunrise Wind has estimated that proposed Project O&M would involve an estimated 76 trips per year, or 2,660 vessel trips over the lifetime of the Project. The majority of vessel trips (2,500) would originate from the Montauk O&M facility, with rare vessel trips (less than one per month) originating from New London, Connecticut, or potentially other unspecified ports (Table 3.14-8, Sunrise Wind FEIS). The increase in vessel traffic of

76 vessel trips per year represents a 0.4 percent increase of vessel traffic within the Project Area. The negligible increase in vessel traffic due to unplanned maintenance is not expected to lead a significant increase in risk of collision with ESA-listed species due to the low number of vessel transits and the low density of these species in the SRWF and SRWEC.

Project-related vessel traffic during O&M would adhere to the same mitigation requirements described above for construction and installation and detailed in COP, Appendix O3 (LGL Ecological Research Associates 2022). While these measures are intended to minimize the risk of vessel strikes; however, the likelihood of sea turtle injury or mortality resulting from Project-related vessel strikes over the duration of the O&M period cannot be discounted. Green, loggerhead, and Kemp's ridley sea turtle populations have generally been increasing over the past few decades, while leatherback sea turtle populations have declined. Because the abundance of sea turtles in the Project Area is anticipated to be generally low with patchy distribution, and the proportional increase in vessel traffic also low, the number of sea turtles injured or killed by vessel strikes as a result of Project construction is expected be low and would not result in significant effects at the population level. Because vessel traffic is likely to result in injury or mortality to some individual sea turtles but is not expected to have population-level effects, O&M vessel traffic is expected to have minor long-term adverse impact on sea turtles.

Lighting: The SRWF would include a variety of operational lighting, including navigational lighting for mariners, obstruction lighting for aviators, and vessel/work lighting for maintenance and operations. Orr et al. (2013) indicate that lights on wind generators flash intermittently for navigation or safety purposes and do not present a continuous light source. Limpus (2006) suggests that intermittent flashing lights with a very short "on" pulse and long "off" interval are non-disruptive to marine turtle behavior, irrespective of the color. Limpus (2006) also indicates that navigation/anchor lights on top of vessel masts are unlikely to adversely affect sea turtles but that bright deck lights should be shielded, if possible, to reduce impacts to sea turtles.

Sea turtles' typical behavior of remaining predominantly submerged would additionally limit the exposure of individuals to operational lighting. Operational lighting would be limited to the minimum required by regulation and for safety (Table H-1, Appendix H), further minimizing the potential for exposure. Based on the available information, it is expected that the impact of operational lighting on sea turtles would be negligible.

Presence of structures: Structural elements of the SRWF would be present for the 25- to 35-year operational life of the proposed Project. Once WTGs and OCS-DC have foundations have been installed within the seafloor, the presence of the operating SRWF would have converted the existing open water habitat to one with increased hard bottom, making it comparable to an artificial reef-like habitat. The presence of the SRWF foundations, scour protection, and IAC protection would create three-dimensional hard-bottom habitats resulting in a reef effect that is expected to attract numerous species of algae, shellfish, finfish, and sea turtles (Langhamer 2012; Reubens et al. 2013; Wilhelmsson et al. 2006). Sea turtles have been observed within the vicinity of offshore structures, such as oil platforms, foraging and resting under the platforms (Gitschlag and Herczeg 1994; National Research Council 1996). High concentrations of sea turtles have been reported around these oil platforms (Gitschlag and Herczeg 1994; National Research Council 1996).

As a result of the increased habitat and foraging opportunities at the new artificial reef-like habitat, sea turtles could potentially remain in areas longer than they normally would and could become susceptible to cold stunning or death; however, artificial habitat created by these offshore structures can provide multiple benefits for sea turtles, including foraging habitats, shelter from predation and strong currents, and methods of removing biological buildup from their carapaces (Barnette 2017; National Research Council 1996). It is estimated that offshore petroleum platforms in the Gulf of Mexico, provided an additional 2,000 mi^2 (5,180 km^2) of hard-bottom habitat (Gallaway 1981). Wakes created by the presence of the foundations may influence distributions of drifting jellyfish aggregations; however, since other prey species available to sea turtles would not be affected by these wakes, impacts on sea turtle foraging are not expected to be substantial (Kraus et al. 2019).

On this basis, BOEM concludes that the presence of visible structures from O&M would have negligible direct effects on sea turtle movement and migration, and negligible to minor beneficial, long-term, indirect effects on the distribution, abundance, and availability of sea turtle prey and forage resources.

3.12.5.3 Conceptual Decommissioning

3.12.5.3.1 Onshore Activities and Facilities

No regular sea turtle nesting occurs in the onshore portion of the proposed Project Area (refer to Section 3.12.1). Decommissioning of onshore facilities is not expected to have any direct impacts to sea turtles, and the potential for impacts is negligible.

3.12.5.3.2 Offshore Activities and Facilities

Proposed Project conceptual decommissioning of offshore components would require the use of construction vessels of similar number and class as used during construction. Decommissioning activities would produce similar short-term effects on sea turtles to those described above for proposed Project construction, including short-term displacement, behavioral alteration, and elevated TSS exposure. Underwater noise and disturbance levels generated during conceptual decommissioning are similar to those described above for construction, with the exception that pile driving would not be required. The monopiles would be cut below the bed surface for removal using a cable saw or abrasive waterjet. Noise levels produced by this type of cutting equipment are generally indistinguishable from engine noise generated by the associated construction vessel (Pangerc et al. 2016). Therefore, this decommissioning equipment would have significantly lower potential for noise effects compared to those already considered for construction vessel noise. Decommissioning activities would be required to obtain all appropriate federal permits and would be required to implement mitigation measures based on those permits and the best available information at that time. It is anticipated that those mitigation measures would be similarly effective as those required for construction and installation. The effects of proposed Project conceptual decommissioning on sea turtles would, therefore, range from negligible to minor.

3.12.5.4 Cumulative Impacts of the Proposed Action

The cumulative impacts of the Proposed Action considers the impacts of the Proposed Action in combination with other ongoing and planned wind activities.

Ongoing and planned activities other than offshore wind development activities that may affect sea turtles include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (refer to Appendix E for a description of ongoing and planned activities). These activities would contribute to the primary IPFs of noise, presence of structures, vessel strikes, incidental capture, and entanglement risk and could result in short-term or permanent displacement and injury to or mortality of individual sea turtles, but population-level effects would not be expected for most sea turtle species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, the Proposed Action would contribute an incremental increase in effects from the primary IPFs for sea turtles.

3.12.5.5 Impacts of Alternative B – Proposed Action on ESA-Listed Species

Based on the information contained in this document, we anticipate that the Proposed Action is likely to have minor adverse impacts to leatherback, loggerhead, Kemp's ridley, or green sea turtles.

3.12.5.6 Conclusions

Impacts from the Proposed Action

Project construction and installation, O&M, and conceptual decommissioning would result in habitat disturbance, entrainment and impingement, underwater and airborne noise, water quality degradation, vessel traffic (strikes and noise), artificial lighting, and potential discharges/spills and trash. BOEM anticipates the impacts resulting from the Proposed Action alone would be **minor** adverse impacts and could include potentially **minor beneficial** impacts. Adverse impacts are expected to result mainly from pile-driving noise and increased vessel traffic. Beneficial impacts are expected to result from the presence of structures.

Cumulative Impacts from the Proposed Action

In the context of other reasonably foreseeable environmental trends and planned actions, the incremental impacts under the Proposed Action resulting from individual IPFs would range from negligible to minor adverse and minor beneficial. Considering all the IPFs together, BOEM anticipates that the overall impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **minor** adverse cumulative impacts to sea turtles and could include potentially **minor beneficial** impacts. The main drivers for impact ratings are pile-driving noise and associated potential for auditory injury, the presence of structures, ongoing climate change, and ongoing vessel traffic posing a risk of collision. The Proposed Action would contribute to the overall impact rating primarily through pile-driving noise and the presence of structures. BOEM made this decision because the overall effect would be detectable and measurable, but these impacts would not result in population-level effects.

While the significance level of impacts would remain the same between the No Action Alternative and the Proposed Action, BOEM could further reduce impacts from the Proposed Action to sea turtles with mitigation measures conditioned as part of the COP approval by BOEM that also includes the mitigation, monitoring, and reporting requirements required in the NMFS biological opinion (see Appendix H).

3.12.6 Alternative C-1 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

Under Alternative C-1, the same number of turbine locations (up to 94 WTGs) under the Proposed Action may be approved by BOEM; however, 8 WTG positions from Priority Areas 1, 2, 3 or 4 would be removed from consideration (Figure 2.1-7).

3.12.6.1 Construction and Installation

3.12.6.1.1 Onshore Activities and Facilities

No aspect of Alternative C-1 would alter the construction of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.6.1.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-1 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.6.2 Operations and Maintenance

3.12.6.2.1 Onshore Activities and Facilities

No aspect of Alternative C-1 would alter the O&M of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the operation and maintenance of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.6.2.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-1 would significantly alter the O&M methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the O&M of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.6.3 Conceptual Decommissioning

3.12.6.3.1 Onshore Activities and Facilities

No aspect of Alternative C-1 would alter the conceptual decommissioning of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to conceptual decommissioning of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.6.3.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-1 would significantly alter the conceptual decommissioning methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the conceptual decommissioning of the offshore activities or facilities other than what is described under the Proposed Action

3.12.6.4 Cumulative Impacts of Alternative C-1

The cumulative impacts of Alternative C-1 considers the impacts of this alternative in combination with other ongoing and planned wind activities.

Ongoing and planned activities other than offshore wind development activities that may affect sea turtles include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (refer to Appendix E for a description of ongoing and planned activities). These activities would contribute to the primary IPFs of noise, presence of structures, vessel strikes, incidental capture, and entanglement risk and could result in short-term or permanent displacement and injury to or mortality of individual sea turtles, but population-level effects would not be expected for most sea turtle species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, Alternative C-1 would contribute an incremental increase in effects from the primary IPFs for sea turtles.

3.12.6.5 Impacts of Alternative C-1 on ESA-Listed Species

All sea turtles that are likely to occur in the proposed Project Area are listed as threatened or endangered under the ESA; therefore, the effects to these species would the same as described above. Based on the information contained in this document, we anticipate that Alternative C-1 for the SRWF Project is likely to have minor adverse impact to leatherback, loggerhead, Kemp's ridley, or green sea turtles.

3.12.6.6 Conclusions

Impacts from Alternative C-1

Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-1 are the same as described under the Proposed Action (Alternative B), **minor** adverse with potential **minor beneficial** impacts.

Cumulative Impacts from Alternative C-1

Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for cumulative impacts of Alternative C-1 are the same as described under the cumulative impacts of the Proposed Action (Alternative B), **minor** adverse with potential **minor beneficial** impacts.

3.12.7 Alternative C-2 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

The primary effect of this alternative is the relocation of WTGs from priority areas to the eastern portion of the Lease Area. This proposed change would not significantly alter the construction methods, O&M, or conceptual decommissioning and would not result in additional impacts to sea turtles other than those described under the Proposed Action (Alternative B).

3.12.7.1 Construction and Installation

3.12.7.1.1 Onshore Activities and Facilities

No aspect of Alternative C-2 would alter the construction of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.7.1.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-2 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the offshore activities or facilities other than what is described under the Proposed Action

3.12.7.2 Operations and Maintenance

3.12.7.2.1 Onshore Activities and Facilities

No aspect of Alternative C-2 would alter the O&M of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the operation and maintenance of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.7.2.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-2 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.7.3 Conceptual Decommissioning

None of the proposed changes from Alternative C-2 would significantly alter the O&M methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the O&M of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.7.3.1 Onshore Activities and Facilities

No aspect of Alternative C-2 would alter the conceptual decommissioning of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to conceptual decommissioning of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.7.3.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-2 would significantly alter the conceptual decommissioning methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the conceptual decommissioning of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.7.4 Cumulative Impacts of Alternative C-2

The cumulative impacts of Alternative C-2 consider the impacts of this alternative in combination with other ongoing and planned wind activities.

Ongoing and planned activities other than offshore wind development activities that may affect sea turtles include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (Refer to Appendix E for a description of ongoing and planned activities). These activities would contribute to the primary IPFs of noise, presence of structures, vessel strikes, incidental capture, and entanglement risk and could result in short-term or permanent displacement and injury to or mortality of individual sea turtles, but population-level effects would not be expected for most sea turtle species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, Alternative C-2 would contribute an incremental increase in effects from the primary IPFs for sea turtles.

3.12.7.5 Impacts of Alternative C-2 on ESA-Listed Species

All sea turtles that are likely to occur in the proposed Project Area are listed as threatened or endangered under the ESA; therefore, the effects to these species would the same as described above. Based on the information contained in this document, we anticipate that Alternative C-2 for the SRWF Project is likely to have minor adverse impacts to leatherback, loggerhead, Kemp's ridley, or green sea turtles.

3.12.7.6 Conclusions

Impacts from Alternative C-2

Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-2 are the same as described under the Proposed Action (Alternative B), **minor** adverse with potential **minor beneficial** impacts.

Cumulative Impacts from Alternative C-2

Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for cumulative impacts of Alternative C-2 are the same as described under the cumulative impacts of the Proposed Action (Alternative B), **minor** adverse with potential **minor beneficial** impacts.

3.12.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility Due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.12.8.1 Construction and Installation

Alternative C-3 differs from Alternative B (Proposed Action) only with the location of the WTGs. Alternatives C-3a, C-3b, and C-3c consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Under Alternative C-3a, up to 87 11-MW WTGs would be installed in the 87 potential positions. Under Alternative C-3b, up to 84 WTGs would be

installed in the 87 potential positions. Under Alternative C-3c, 80 WTGs would be installed in the 87 potential positions.

3.12.8.1.1 Onshore Activities and Facilities

No aspect of Alternative C-3 would alter the construction of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.8.1.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-3 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.8.2 Operations and Maintenance

3.12.8.2.1 Onshore Activities and Facilities

No aspect of Alternative C-3 would alter the O&M of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the operation and maintenance of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.8.2.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-3 would significantly alter the construction methods for offshore structures and installation of equipment compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the construction of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.8.3 Conceptual Decommissioning

None of the proposed changes from Alternative C-3 would significantly alter the O&M methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the O&M of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.8.3.1 Onshore Activities and Facilities

No aspect of Alternative C-3 would alter the conceptual decommissioning of the proposed onshore facilities as compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to conceptual decommissioning of the onshore activities or facilities other than what is described under the Proposed Action.

3.12.8.3.2 Offshore Activities and Facilities

None of the proposed changes from Alternative C-3 would significantly alter the conceptual decommissioning methods for offshore activities and facilities compared to the Proposed Action (Alternative B). Therefore, there would be no direct or indirect impacts to sea turtles due to the conceptual decommissioning of the offshore activities or facilities other than what is described under the Proposed Action.

3.12.8.4 Cumulative Impacts of Alternative C-3

The cumulative impacts of Alternative C-3 consider the impacts of this alternative in combination with other ongoing and planned wind activities.

Ongoing and planned activities other than offshore wind development activities that may affect sea turtles include new submarine cables and pipelines, tidal energy projects, oil and gas activities, dredging and port improvement, marine minerals extraction, military use (i.e., sonar, ship strikes), marine transportation, NMFS research initiatives, and installation of new structures on the United States Continental Shelf (refer to Appendix E for a description of ongoing and planned activities). These activities would contribute to the primary IPFs of noise, presence of structures, vessel strikes, incidental capture, and entanglement risk and could result in short-term or permanent displacement and injury to or mortality of individual sea turtles, but population-level effects would not be expected for most sea turtle species.

In the context of reasonably foreseeable environmental trends, ongoing, and planned activities, Alternative C-3 would contribute an incremental increase in effects from the primary IPFs for sea turtles.

3.12.8.5 Impacts of Alternative C-3 on ESA-Listed Species

All sea turtles that are likely to occur in the proposed Project Area are listed as threatened or endangered under the ESA; therefore, the effects to these species would the same as described above. Based on the information contained in this document, we anticipate that Alternative C-3 for the SRWF Project is likely to have minor adverse impacts to leatherback, loggerhead, Kemp's ridley, or green sea turtles.

3.12.8.6 Conclusions

Impacts from Alternative C-3

Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-3 are the same as described under the Proposed Action (Alternative B), **minor** adverse with potential **minor beneficial** impacts.

Cumulative Impacts from Alternative C-3

Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-3 are the same as described under the cumulative impacts of the Proposed Action (Alternative B), **minor** adverse with potential **minor beneficial** impacts.

3.12.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall minor adverse impacts and minor beneficial impacts on sea turtles. Table 3.12-9 provides an overall summary of alternative impacts.

Table 3.12-9. Comparison of Alternative Impacts on Sea Turtles

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: BOEM anticipates that the sea turtle impacts due to current environmental trends and ongoing activities associated with the No Action Alternative would be **minor** adverse with the potential for **minor beneficial** impacts. *Cumulative Impacts of the No Action Alternative:* Under the No Action Alternative, existing environmental trends and ongoing activities, natural and human-caused IPFs would continue to affect sea turtles. BOEM anticipates that the overall cumulative impacts associated Alternative A, the No Action Alternative, when combined with all other planned activities (including offshore wind) in the	*Proposed Action:* BOEM anticipates the impacts resulting from the Proposed Action alone would be **minor** adverse impacts and could include potentially **minor beneficial** impacts. Adverse impacts are expected to result mainly from pile-driving noise and increased vessel traffic. Beneficial impacts are expected to result from the presence of structures. *Cumulative Impacts of the Proposed Action:* In the context of other reasonably foreseeable environmental trends and planned actions, the incremental impacts under the Proposed Action resulting from individual IPFs would be **minor** adverse and **minor beneficial**.	*Alternative C-1:* Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts of Alternative C-1 are the same as described under the Proposed Action, **minor** adverse impacts and potentially **minor beneficial** impact. *Cumulative Impacts of Alternative C-1:* Alternative C-1 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for cumulative impacts of Alternative C-1 are the same as described under the cumulative impacts of the Proposed Action, **minor**	*Alternative C-2:* Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts of Alternative C-2 are the same as described under the Proposed Action, **minor** adverse impacts and potentially **minor beneficial** impact. *Cumulative Impacts of Alternative C-2:* Alternative C-2 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for cumulative impacts of Alternative C-2 are the same as described under the cumulative impacts of the Proposed Action, **minor**	*Alternative C-3:* Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts of Alternative C-3 are the same as described under the Proposed Action, **minor** adverse impacts and potentially **minor beneficial** impacts. *Cumulative Impacts of Alternative C-3:* Alternative C-3 includes changes to turbine installation locations that would not alter any of the findings for sea turtles. Therefore, the conclusions for impacts and cumulative impacts of Alternative C-3 are the same as described under the cumulative impacts of the Proposed

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
GAA would result in overall **minor** adverse and **minor beneficial** impacts.	Considering all the IPFs together, BOEM anticipates that the overall cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **minor** adverse impacts to sea turtles and could include potentially **minor beneficial** impacts. The main drivers for impact ratings are pile-driving noise and associated potential for auditory injury, the presence of structures, ongoing climate change, and ongoing vessel traffic posing a risk of collision.	adverse impacts and potentially **minor beneficial** impacts.	adverse impacts and potentially **minor beneficial** impacts.	Action, **minor** adverse impacts and potentially **minor beneficial** impacts.

3.12.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1.-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. These impacts include exposure to increased vessel traffic, underwater noise impacts from Project construction and O&M, temporary habitat disturbance, and long-term habitat conversion. These adverse impacts would be avoided and minimized using the same APMs as described in the Proposed Action (see Table 3.12-10 below). Alternative C-3b would also generate similar beneficial reef effects but

over a smaller area and with a reduced number of reef-forming structures. The resulting effects to sea turtles would therefore be similar to those described for the Proposed Action but reduced in extent and/or duration. The implementation of the Preferred Alternative in comparison to the Proposed Action (Alternative B) would result in an incremental reduction in effects from some construction and installation, O&M, and decommissioning impacts; however, BOEM anticipates that any incremental reduction in impacts would not change the resulting effects on sea turtles to the extent necessary to alter the impact-level conclusions for any impact mechanism. The incremental impact of Alternative C-3b, when compared to the No Action Alternative, would be similar to the Proposed Action: **minor** adverse impacts with potential **minor beneficial** impacts.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that Alternative C-3bs impacts to sea turtles would be similar to the Proposed Action (with individual IPFs leading to impacts ranging from negligible to minor adverse and minor beneficial). The overall impacts of Alternative C3-b when combined with past, present, and reasonably foreseeable activities would therefore be the same level as under the Proposed Action: **minor** adverse with potentially **minor beneficial** impacts.

3.12.11 Proposed Mitigation Measures

The mitigation measures listed in Table 3.12-10 are recommended for inclusion in the Preferred Alternative.

Table 3.12-10. Proposed Mitigation Measures: Sea Turtles

Measure	Description	Effect
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. By January 31 of each year, the Lessee must submit to USDOI an annual report that describes its marine trash and debris awareness training process, number of people trained, estimated related costs, and certifies that the training process has been followed for the previous calendar year.	Marine debris and trash awareness training would minimize the risk of sea turtle ingestion of or entanglement in marine debris. While adoption of this measure would decrease risk to marine mammals under the Proposed Action, it would not alter the impact determination of negligible for accidental releases.
PAM Plan	BOEM, BSEE, and USACE shall ensure that Sunrise Wind prepares a PAM Plan that describes all proposed equipment, deployment locations, detection review methodology and other procedures, and protocols related to the required use of PAM for monitoring. This plan must be submitted to NMFS, BOEM and BSEE (at OSWsubmittals@bsee.gov) for review and concurrence at least 90 days prior to the planned start of pile driving.	Sunrise Wind has committed to implementing passive acoustic monitoring, pile driving monitoring, PSO coverage, sound field verification, and shutdown zones as part of the Proposed Action. Compliance with these APMs would be enforced by BOEM, BSEE, and NMFS as indicated in Table H-1. Implementation and
Pile driving monitoring plan	BOEM shall ensure that Sunrise Wind prepare and submit a *Pile Driving Monitoring Plan* to NMFS and BSEE (at OSWsubmittals@bsee.gov) for review and concurrence at	

Measure	Description	Effect
	least 90 days before start of pile driving. The plan shall detail all plans and procedures for sound attenuation as well as for monitoring ESA-listed whales and sea turtles during all impact and vibratory pile driving. The plan shall also describe how BOEM, BSEE, and Sunrise Wind would determine the number of whales exposed to noise above the Level B harassment threshold during pile driving with the vibratory hammer to install the cofferdam at the sea-to-shore transition. Sunrise Wind must obtain NMFS' concurrence with this plan prior to starting any pile driving.	enforcement of these APMs would minimize the potential for underwater noise exposure to sea turtles during the conduct of impact pile driving, vibratory pile driving, HRG surveys, and UXO detonation, as disclosed in the analysis of the Proposed Action. Agency-proposed mitigation measures would further define how the effectiveness and enforcement of APMs would be ensured, by requiring that Sunrise Wind submit PAM and pile driving monitoring plans for approval by BOEM, BSEE, and NMFS and a sound field verification plan for approval by BOEM and BSEE; by ensuring that PSO coverage is sufficient and requiring deployment of additional PSOs or platforms if found insufficient or in the event that clearance or shutdown zones are expanded beyond the distances modeled prior to verification. While adoption of these measures would increase accountability and ensure the effectiveness of APMs, it would not alter the impact determination of minor for the underwater noise IPF for sea turtles, because analysis of the Proposed Action already includes analysis of the APMs outlined in Table H-1.
PSO Coverage	BOEM, BSEE, and USACE shall ensure that PSO coverage is sufficient to reliably detect marine mammals and sea turtles at the surface in clearance and shutdown zones to execute any pile driving delays or shutdown requirements. If, at any point prior to or during construction, the PSO coverage that is included as part of the Proposed Action is determined not to be sufficient to reliably detect ESA-listed whales and sea turtles within the clearance and shutdown zones, additional PSOs and/or platforms would be deployed. Determinations prior to construction would be based on review of the *Pile Driving Monitoring Plan*. Determinations during construction would be based on review of the weekly pile driving reports and other information, as appropriate.	
Sound field verification	BOEM, BSEE, and USACE shall ensure that if the clearance and/or shutdown zones are expanded, PSO coverage is sufficient to reliably monitor the expanded clearance and/or shutdown zones. Additional observers shall be deployed on additional platforms for every 1,500 m that a clearance or shutdown zone is expanded beyond the distances modeled prior to verification.	
Shutdown zones	BOEM, BSEE, and USACE may consider reductions in the pre-start clearance and/or shutdown zones based on the sound field verification measurements. BOEM and BSEE shall ensure that Sunrise Wind submits a Sound Field Verification Plan for review and approval at least 90 days prior to the planned start of pile driving.	
Monitoring zone for sea turtles	BOEM, BSEE, and USACE shall ensure that Sunrise Wind monitors the full extent of the area where noise would exceed the 175 dB rms threshold for sea turtles for the full duration of all pile driving activities and for 30 minutes following the cessation of pile driving activities and record all observations in order to ensure that all take that occurs is documented.	

Measure	Description	Effect
Look out for sea turtles and reporting	Between June 1 and November 30, Sunrise Wind shall have a trained lookout posted on all vessel transits during all phases of the project to observe for sea turtles. The trained lookout would communicate any sightings, in real time, to the captain so that the requirements below can be implemented. Look out protocols are briefly summarized here. See Table H-3 for more information. The trained lookout would maintain a vigilant watch and monitor a Vessel Strike Avoidance Zone (500 m) at all times to maintain minimum separation distances from ESA-listed species. If a sea turtle is sighted within 100 m or less of the operating vessel's forward path, the vessel operator would 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 at which time the vessel may resume normal operations. If a sea turtle is sighted within 50 m of the forward path of the operating vessel, the vessel operator would shift to neutral when safe to do so and then proceed away from the turtle at a speed of 4 knots. The vessel may resume normal operations once it has passed the turtle. Vessel captains/operators would avoid transiting through areas of visible jellyfish aggregations or floating sargassum lines or mats. In the event that operational safety prevents avoidance of such areas, vessels would slow to 4 knots while transiting through such areas. The only exception is when the safety of the vessel or crew necessitates deviation from these requirements on an emergency basis. If any such incidents occur, they must be reported to NMFS and BSEE within 24 hours. If a vessel is carrying a PSO or trained lookout for the purposes of maintaining watch for North Atlantic right whales, an additional lookout is not required and this PSO or trained lookout must maintain watch for whales and sea turtles.	Measures to minimize vessel interactions would reduce risk of vessel strike. While adoption of this measure would reduce risk to sea turtles under the Proposed Action, it would not alter the impact determination of minor for vessel traffic.
Sea turtle/Atlantic sturgeon identification and data collection	Any sea turtles or Atlantic sturgeon caught and/or retrieved in any fisheries survey gear would first be identified to species or species group. Each ESA-listed species caught and/or retrieved would then be properly documented using appropriate equipment and data collection forms. Biological data, samples, and tagging would occur as outlined below. Live, uninjured animals should be returned to the water as quickly as possible after completing the required handling and documentation. See detailed information in Table H-3.	The regular hauling of sampling gear, recovery of lost survey gear, sea turtle disentanglement, and handling and resuscitation guidelines would reduce risk of entanglement or effects of entanglement in fisheries survey gear. Gear identification, sea turtle identification, and data collection would improve accountability in the case of gear loss or gear entanglement. While adoption of these measures would reduce risk to sea turtles
Sea turtle/Atlantic sturgeon	Any sea turtles or Atlantic sturgeon caught and retrieved in gear used in fisheries surveys would be handled and resuscitated (if unresponsive) according to established	

Measure	Description	Effect
handling and resuscitation guidelines	protocols and whenever at-sea conditions are safe for those handling and resuscitating the animal(s) to do so. Specific protocols are outlined in Table H-3.	and improve accountability under the Proposed Action, it would not alter the impact determination of minor for gear utilization.
Take notification	GARFO PRD would be notified as soon as possible of all observed takes of sea turtles, and Atlantic sturgeon occurring as a result of any fisheries survey. Specific protocols are outlined in Table H-3.	Reporting requirements to document take would improve accountability for documenting sea turtle take associated with the Proposed Action. While adoption of these measures would improve accountability, it would not alter the overall impact determination for the Proposed Action.
Monthly/ annual reporting requirements	BOEM and BSEE would ensure that Sunrise Wind submits regular reports (in consultation with NMFS) necessary to document the amount or extent of take that occurs during all phases of the Proposed Action. Details of reporting would be coordinated between Sunrise Wind, NMFS, BOEM and BSEE. All reports would be sent to: nmfs.gar.incidental-take@noaa.gov and BSEE at OSWsubmittals@bsee.gov.	
Nighttime pile driving monitoring plan	BOEM would require Sunrise Wind to submit a nighttime pile driving monitoring plan for NMFS and BOEM review and approval six months prior to initiating impact pile driving activities. The purpose of the plan is to demonstrate that Sunrise Wind can meet the visual monitoring criteria for the Level A harassment zone(s)/mitigation and monitoring zones plus an agreed upon buffer zone (these combined zones are referred to henceforth as the nighttime clearance and shutdown zones) with the technologies Sunrise Wind is proposing to use for monitoring during nighttime impact pile driving. The nighttime pile driving monitoring plan would include the following components: identification of night vision devices (e.g., mounted thermal/IR camera systems, hand-held or wearable NVDs, IR spotlights) that would be used to detect protected marine mammal and turtle species relative to the nighttime clearance and shutdown zones; discussion of the efficacy (range and accuracy) of each device proposed for nighttime monitoring, including an assessment of the results of the Thayer Mahan Field Trial, and only devices that meet the visual monitoring criteria as demonstrated by Thayer Mahan Field Trial to be capable of detecting marine mammals and sea turtles to the maximum extent of the nighttime clearance and shutdown zones would be acceptable for nighttime monitoring (use of devices not assessed in the Thayer Mahan Field Trial would not be permitted); procedures and timeframes for notifying NMFS, BOEM and BSEE of Sunrise Wind's intent to pursue nighttime impact pile driving; and, reporting procedures, contacts, and timeframes.	Adoption of this measure could increase the ability of Sunrise Wind to detect sea turtles during pile driving but, given the small amount of time that sea turtles spend at the surface, these measures would not eliminate the minor impacts of pile-driving noise on sea turtles.

Measure	Description	Effect
Data Collection Biological Assessment BMPs	BOEM and BSEE would 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 construction, maintenance and operations of the Sunrise Wind project as applicable.	Compliance with Project Design Criteria and best management practices for protected species would minimize risk to sea turtles during HRG surveys. While adoption of this measure would decrease risk to sea turtles under the Proposed Action, it would not alter the impact determination of negligible for HRG activities.
Vessel speed restriction	All vessels 65 ft (20 m) or longer subject to the jurisdiction of the U.S. would comply with the 10-knot speed restriction when entering or departing a port or place subject to U.S. jurisdiction, and in any SMA during North Atlantic right whale (NARW) migratory and calving periods from November 1 to April 30 Standard plan: "Between November 1 and April 30: Vessels of all sizes would 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 North Atlantic right whales. Vessels transiting from other ports outside those described would 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 would operate at 10 knots or less in any Dynamic Management Areas.	While adoption of this measure would reduce risk to sea turtles under the Proposed Action, it would not alter the impact determination of minor for vessel traffic.

3.12.11.1 Effect of Measures Incorporated into the Preferred Alternative

The mitigation measures listed in Table 3.12-10 are recommended for inclusion in the Preferred Alternative. These measures are detailed in Table 3.12-10 and include vessel speed restrictions, protocols for reporting, specific protocols for monitoring and mitigation during pile driving, and other strategies. These measures, if adopted, would have the effect of further reducing the overall impact from the Preferred Alternative.

In addition to the mitigation listed above, NMFS has identified terms and conditions in the Biological Opinion for the Sunrise Wind Project in support of BOEM's ESA consultation with NMFS. These terms and conditions are included in Appendix H, Table H-2 and the final terms and conditions would be incorporated into the ROD as conditions of COP approval.

3.13 Wetlands and Other Waters of the United States

3.13.1 Description of Affected Environment

This section discusses potential impacts on wetlands and other WOTUS from the proposed Project, alternatives, and future offshore wind activities in the GAA (Appendix D, Figure D-10). The Wetlands and other WOTUS GAA as described in Appendix D, includes the terrestrial components of the Carmans River-Great South Bay watershed (HUC-0203020203) and Shinnecock Bay-Atlantic Ocean watershed (HUC-0203020206).

The National Wetlands Inventory (NWI) data was used to determine the potential presence of wetlands within the proposed Project Area. The onshore portions of the project are located within the Carmans River-Great South Bay watershed (HUC-0203020203) and Shinnecock Bay-Atlantic Ocean watershed (HUC-0203020206), which are part of the Southern Long Island Subbasin (HUC-02030202). The Project landfall site begins at Smith Point County Park of Fire Island and crosses the William Floyd Parkway and the ICW to Smith Point Marina located on the mainland. Smith Point Park falls within Fire Island National Seashore and abuts the eastern end of the Otis Pike Fire Island High Dune Wilderness (Figure 3.13-2). This is the only federally designated wilderness area in the state of New York.

Within the GAA (Appendix D, Figure D-10), NWI data identified a variety of freshwater and tidal wetlands (Table 3.13-1). Freshwater forested/shrub wetland communities account for more than half of all the freshwater wetlands in the GAA (Figure 3.13-1 and Figure 3.13-2). Riverine wetlands in the GAA are exclusively associated with the Carmans River (Figure 3.13-1). Tidal wetlands include both estuarine and marine wetlands and are associated with the ICW and the Atlantic Ocean (Figure 3.13-2).

Table 3.13-1. National Wetlands Inventory Wetlands in the Geographic Analysis Area

Wetland Type	Acres	Percent Total
Freshwater Wetlands		
Freshwater emergent wetland	271.1	8.1%
Freshwater forested/shrub wetland	1,779.5	53.2%
Freshwater pond	754.2	22.6%
Lake	505.7	15.1%
Riverine	29.7	0.9%
Palustrine farmed [1]	4.0	0.1%
Total	**3,344.2**	**100%**
Tidal Wetlands		
Estuarine and marine wetland	9,130.7	3.1%
Estuarine and marine deepwater	287,750.0	96.9%
Total	**296,880.7**	**100%**

Source: USFWS 2022

[1] Farmed wetlands are defined as wetlands where "the soil surface has been mechanically or physically altered for production of crops, but where hydrophytes would become reestablished if the farming were discontinued."

Significant Natural Communities. Four wetland communities adjacent to the proposed onshore facilities were identified as significant natural communities by the NYNHP (see agency correspondence in Appendix C of Appendix L of the COP, Stantec 2022). These community types include the red maple – blackgum swamp, the brackish tidal marsh, the marine back-barrier Lagoon, and the marine eelgrass meadow.

Red Maple-Blackgum Swamp. A red maple - blackgum swamp is present along the eastern side of the Carmans River south of the LIE Service Road. Dominant tree species include black tupelo (*Nyssa sylvatica*) and red maple (*Acer rubrum*) along with understory species such as clammy azalea (*Rhododendron viscosum*) and coastal sweet pepperbush (*Clethra alnifolia*) (NYSDEC 2008). This freshwater wetland is located approximately 300 ft (91 m) south of the LIE Service Road. No impacts to this wetland are anticipated.

Brackish Tidal Marsh. A 214-ac (87 ha) brackish tidal marsh was identified along the Carmans River approximately 0.5 (0.8 km) south of the onshore transmission cable location. This community is dominated by graminoids including salt marsh bulrush (*Bolboschoenus robustus*), Olney three-square (*Schoenoplectus americanus*), and wild rice (*Zizania aquatica*) (NYSDEC 2008). Due to the distance of this community to the proposed Project, no impacts to this wetland are anticipated.

Marine Eelgrass Meadow. Extensive eelgrass (*Zostera marina)* meadows are present in Narrow Bay between Smith Point County Park on Fire Island and Smith Point Marina on the mainland. The grass beds provide spawning and foraging habitat for mollusks, crustaceans, juvenile fish, and diving ducks and help stabilize sediments (NYSDEC 2008; Edinger et al. 2014). Further discussion of SAV is provided in Section 3.7 (*Benthic Resources*).

Marine Back-barrier Lagoon. A large marine back-barrier lagoon occurs in parts of Great South Bay and Moriches Bay near the landfall/ICW work area, surrounded by developed lands. The protected shores of the lagoons support grass beds, mudflats, and salt marshes. The trenchless construction methods currently proposed to install the onshore transmission cable would avoid and minimize potential impacts to this community type.

A wetland delineation was conducted in the proposed Landfall/ICW work areas and along the proposed onshore transmission cable route (COP, Appendix L, Stantec 2022). Several tidal and freshwater wetlands were delineated during the field surveys for the proposed Project (Figure 3.13-1 and Figure 3.13-2). These wetlands included three tidal wetlands and two freshwater wetlands associated with the Landfall/ICW Area/Temporary Landing Structure on Fire Island, and two freshwater watercourses, two freshwater waterbodies, and five freshwater wetlands associated with the onshore transmission cable route (COP, Section 4.4.1.1, Sunrise Wind 2023).

Landfall/ICW Area/Temporary Landing Structure

Tidal wetlands occur along the low energy bay side of Fire Island. The three delineated tidal wetlands are characterized as estuarine, intertidal wetlands (E1SS/EM) and occur on sand and sandy loam soils. Common plant species include Jesuit's bark (*Iva frutescens*), common reed (*Phragmites australis*), rambler rose (*Rosa multiflora*), and groundsel tree (*Baccharis halimifolia*).

Both freshwater wetlands associated with Landfall/ICW Area are palustrine emergent wetlands (PEM) that occur in a man-made basin. These wetlands are dominated by common reed and soils range from sand to fine sandy loam soils.

Onshore Transmission Cable Route

The onshore transmission cable would run adjacent to NYSDEC-regulated freshwater wetlands at the Carmans River. The Carmans River may be used by New York RTE species including species of special concern such as the eastern box turtle (*Terrapene carolina carolina*) and osprey (*Pandion haliaetus*); New York threatened species including the pied-billed grebe (*Podilymbus podiceps*); and New York endangered species such as the peregrine falcon (*Falco peregrinus*) and eastern box turtle (*Terrapene carolina carolina*). Some segments of the river also support concentrations of sea-run brown trout (*Salmo trutta*) and wild brook trout (*Salvelinus fontinalis*) (NYSDEC 2008).

The Carmans River is impounded by a small dam at approximately 3.5 RM upstream of the river mouth, resulting in a lacustrine waterbody (L1UBHh) north of Horseblock Road/ Victory Avenue. South of the dam, the Carmans River has been channelized (R2UBH) as a result of historic roadway construction. Field delineations identified a second perennial watercourse (R2UB2) flowing southeast from a freshwater pond (PUBHh) to the impounded lacustrine waterbody associated with the Carmans River.

One isolated palustrine scrub shrub wetland (PSS1E) was identified south of the freshwater pond (Figure 3.13-1. This wetland occurs on mucky peat soils in a confined basin. Common vegetation includes clammy azalea, highbush blueberry (*Vaccinium corymbosum*), and skunk cabbage (*Symplocarpus foetidus*).

Four forested wetlands (PFO1E) were delineated during field surveys. Soils ranged from sand to mucky peat. Common vegetation includes red maple, black tupelo , American elm (*Ulmus americana*), highbush blueberry, clammy azalea, coastal sweet pepperbush (*Clethra alnifolia*), smooth arrow-wood (*Viburnum recognitum*), maleberry (*Lyonia ligustrina*), lamp rush (*Juncus effusus*), cinnamon fern (*Osmundastrum cinnamomeum*), tussock sedge (*Carex stricta*), and skunk cabbage (Sunrise Wind 2023; Stantec 2022; DNV-GL 2021).

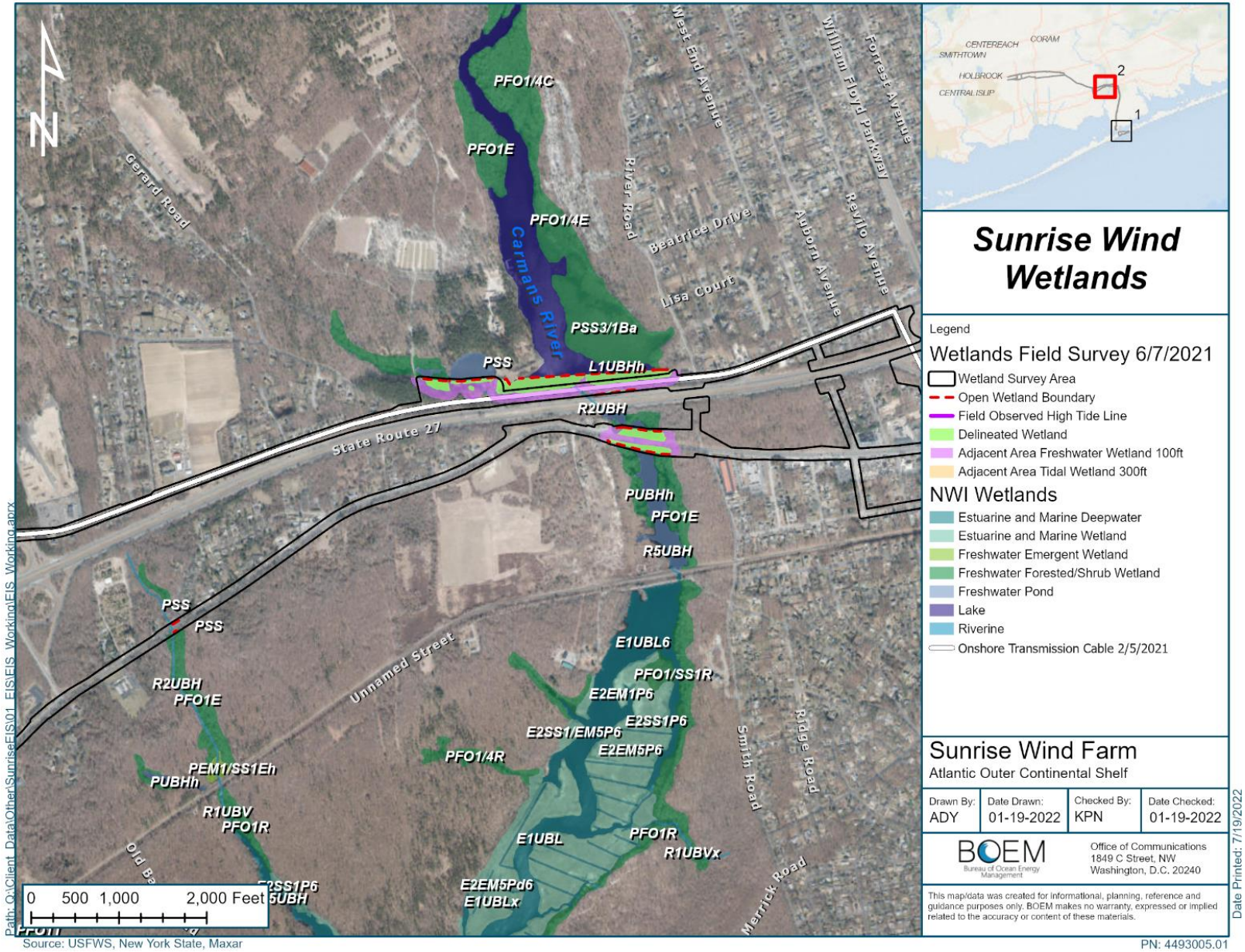

Figure 3.13-1. Delineated and NWI Wetlands in Project Area Crossing Carmans River

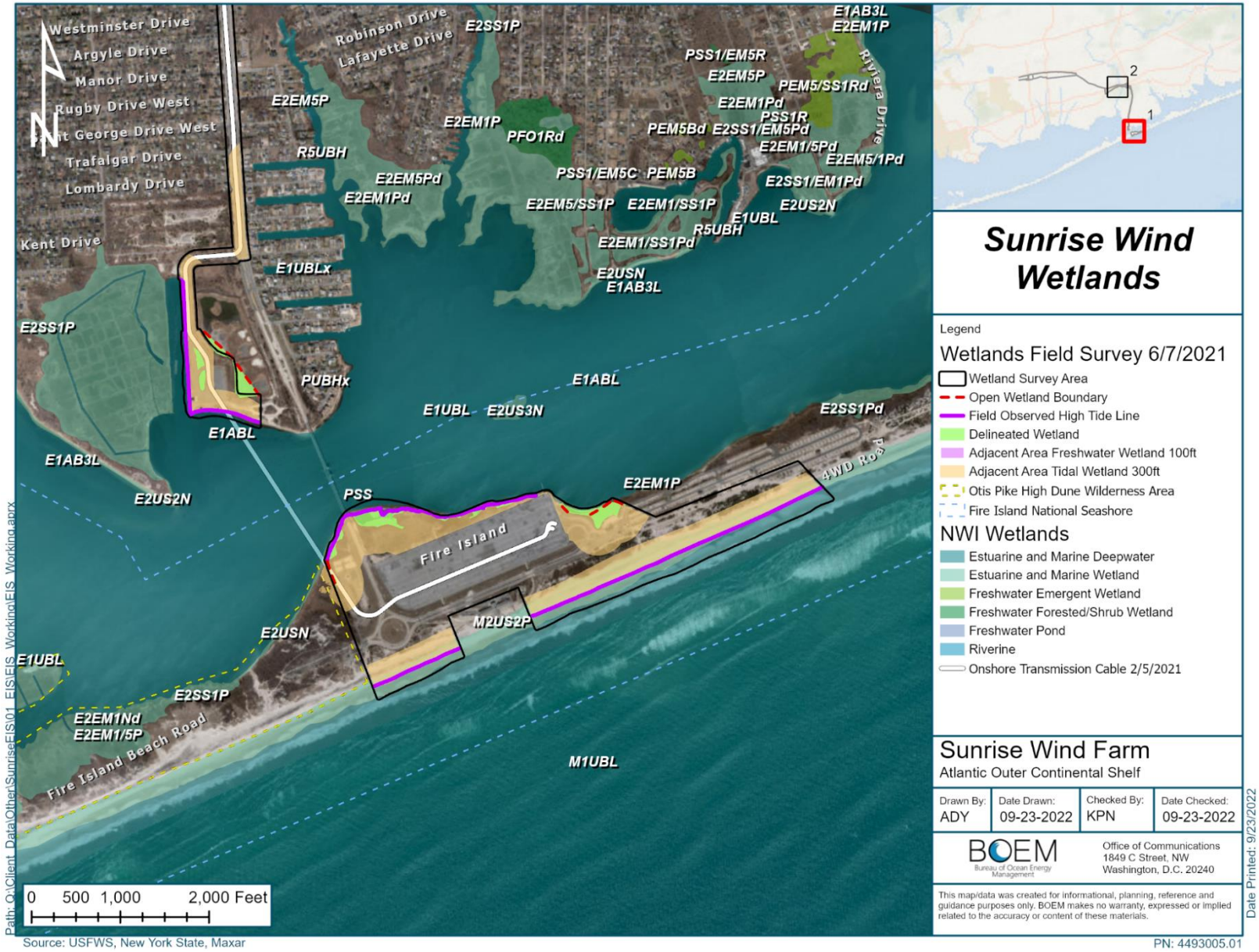

Figure 3.13-2. Delineated and NWI Wetlands in Project Area

3.13.2 Impact Level Definitions for Wetlands and Other Waters of the United States

This Final EIS uses a four-level classification scheme to analyze potential impact levels on wetlands and other WOTUS from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term (temporary) or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur for the duration of the project or beyond project operations and decommissioning.

The USACE and NYSDEC define wetland impacts differently than BOEM as defined under CWA Section 404. The USACE defines temporary impacts as those that occur when fill or cut impact occur in wetlands that are resorted to pre-construction contours when construction activities are complete. Conversion of a wetland type is considered a permanent impact.

Table 3.13-2 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for wetlands and other WOTUS. Table G-12 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to wetlands and other WOTUS.

Table 3.13-2. Definition of Potential Adverse and Beneficial Impact Levels for Wetlands and Other Waters of the United States

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	Either no effect or no measurable impacts.	Either no effect or no measurable impacts
Minor	Small, measurable, adverse impacts to local wetland or other WOTUS extent, quality, or function; localized; could be avoided with mitigation; impacts that do occur are short-term or temporary in nature; complete recovery anticipated	Small and measurable effects that would increase the extent, quality, and functions of wetlands and other WOTUS in the proposed Project Area
Moderate	Notable and measurable adverse impacts to the extent, functions, or quality of wetlands or other WOTUS could occur, and the affected resource would recover completely with remedial or mitigating activities within a specified time frame.	Notable and measurable effects comprising an increase in the extent, functions, or quality of wetlands or other WOTUS in the proposed Project Area
Major	Measurable, long-term, and widespread (regional or population-level) adverse impacts to the extent, functions, or quality of wetlands or other WOTUS could occur, and full recovery not anticipated even with remediation or mitigation.	Measurable and widespread (regional or population-level) increase in extent, function, or quality of wetlands or other WOTUS.

3.13.3 Impacts of Alternative A - No Action on Wetlands and Other Waters of the United States

When analyzing the impacts of the No Action Alternative on WOTUS, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities, on the baseline conditions for WOTUS. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.13.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, impacts to wetlands would still be affected by IPFs from other ongoing activities and current environmental trends such as land use and climate change. Ongoing onshore development activities other than offshore wind within the GAA and climate change may contribute to impacts to wetlands or areas near wetlands. Onshore development activities may include visible infrastructure such as onshore wind turbines and cell towers, port development, other energy projects such as transmission and pipeline projects, and coastal development projects driven by population growth such as residential, commercial, and industrial development. Appendix E (Planned Activities Scenario) provides a description of ongoing activities that may have continuing temporary or permanent impacts to wetlands and areas adjacent to wetlands. Onshore construction activities may permanently (e.g., fill placement) and temporarily (e.g., vegetation removal, noise) impact wetland habitat, flora and fauna, water quality, and hydrological functions. All activities would be required to comply with federal, state, and local regulations protecting wetlands and other WOTUS, thereby avoiding or minimizing impacts. Mitigation would be anticipated for projects to compensate for wetland loss. Climate change is anticipated to continue to impact wetlands and other WOTUS. Sea level rise caused by climate change would result in the conversion of vegetated wetlands into open water which would result in a loss of wetland functions associated with vegetated wetlands. Although wetlands may migrate landward, onshore features such as steep slopes or developed landscapes may impede the transition. Rising sea levels may cause saltwater encroachment into freshwater wetlands which would result in a change in wetland plant communities, habitat, and wetland functions.

Ongoing offshore wind activities within the GAA that contribute to impacts on wetlands include:

- Continued O&M of the Block Island Project (5 WTGs) installed in state waters;
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497, and;
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of the Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Forks projects would affect wetlands through the primary IPFs of land disturbance, sediment suspension and deposition, discharges and releases, and noise. Ongoing offshore wind activities would have the same type of impacts from of land disturbance, sediment suspension and deposition,

discharges and releases, and noise that are described in the following section for planned offshore wind activities.

3.13.3.2 Cumulative Impacts of the No Action Alternative

Future offshore wind activities and current environmental trends may have impacts on wetlands and other WOTUS if onshore activities from these projects overlaps with the GAA. Appendix E provides additional information on other ongoing and planned actions considered in the planned activities scenario that contribute to the No Action baseline. Future offshore wind activities including projects proposed for development in Lease Area 0500 Bay State would likely have cable landings intersecting the GAA of the Proposed Action. Potential impacts of future offshore wind activities would likely be similar to those of the Proposed Action.

Land disturbance: Construction of onshore components for potential future offshore wind projects is anticipated to require vegetation clearing, excavating, trenching, filling, and grading. These activities may permanently or temporarily reduce, alter, or degrade wetland resources. Fill material permanently placed in wetlands during construction would result in the permanent loss of wetland habitat and functions, including flood and storage capacity and water quality functions, such as nutrient removal and sediment stabilization. Partially filling or fragmentation of a wetland may result in changes in wetland vegetation communities (e.g., forested wetland to herbaceous wetland). This could result in habitat loss or a change in natural hydrologic flow impeding a wetland's capacity to retain stormwater and floodwater. Permanent fill, fragmentation, or alteration in vegetation communities could drive out native, wetland species, and provide habitat for opportunistic edge and invasive species. Permanent wetland loss or alteration could affect wetlands within the watershed and reduce capacity of regional wetlands to provide wetland functions. Short-term impacts, such as rutting, compaction, and mixing of topsoil and subsoils during construction activities may temporarily affect the function of wetlands. Impacts from land disturbance on wetlands would be moderate because permanent wetland impacts would likely occur, and compensatory mitigation would be required under Section 404 of the CWA.

Sediment suspension and deposition: Sedimentation resulting from construction activities would increase the concentration of suspended solids in the water column which would affect water quality and wetland functions (e.g., smother sensitive vegetation, reduce water oxygen levels, or decrease the water storage capacity of the wetland) in adjacent or nearby wetlands or other WOTUS. The degree of impacts would depend on the type of construction activity, the extent of sediment loads, the duration of suspended sediment, and the proximity of the activities to the wetland. These impacts would be expected to be short-term and would occur largely during construction and decommissioning of the project (Refer to Section 3.5 *Water Quality*). However, sedimentation may occur during O&M if new ground disturbance is required during routine maintenance.

Discharges and releases: Spills or accidental releases of fuels, lubricants, or hydraulic fluids could occur during the construction of onshore components and could impact adjacent or nearby wetland or other WOTUS by reducing water quality and degrading habitat. Although a primary function of wetlands is to

filter contaminants, a significant increase in the contaminate load could inhibit the wetland from performing water quality functions. Accidental spills are most likely to occur during construction and decommissioning but may occur during O&M to a lesser extent. However, due to construction and compliance measures, the frequency of spills and the volume of spilled materials are expected to be small. Compliance with applicable state and federal regulations related to oil spills and waste handing would minimize potential impacts from accidental spills. Trash and debris from onshore work area during construction of onshore components could have also have temporary effects on water quality and habitat in adjacent or nearby wetland or other WOTUS. With proper waste management procedures, the potential for trash or debris to be inadvertently introduced into wetland or other WOTUS is unlikely. Impacts for accidental releases and trash or debris are expected to be minor.

Noise: Noise from ongoing and planned offshore wind construction activities is not expected to be noticeable in onshore wetland habitats due to the distance to the offshore activities. However, noise from onshore activities and construction of other onshore facilities, would disturb and displace wetland fauna. Noise pollution is a reported threat to faunal groups such as amphibians, reptiles, and invertebrates, which are highly threatened (Sordello et al. 2020). Overall, noise is not anticipated to cause any meaningful change to coastal habitats and fauna, resulting in negligible impacts.

Climate Change: Climate change is anticipated to continue to impact wetlands and other WOTUS. Sea level rise caused by climate change would result in the conversion of vegetated wetlands into open water which would result in a loss of wetland functions associated with vegetated wetlands. Although wetlands may migrate landward, onshore features such as steep slopes or developed landscapes may impede the transition. Rising sea levels may cause saltwater encroachment into freshwater wetlands which would result in a change in wetland plant communities, habitat, and wetland functions.

The extent of wetland impacts from these IPFs would depend on the type of construction activity and the proximity of these activities to wetlands. It is anticipated that these impacts would largely occur during construction and decommissioning. Impacts during O&M would likely occur in the event of a fault or failure and would be expected to be short-term and negligible. BOEM expects that onshore components for other offshore wind projects would be designed to avoid wetlands and other WOTUS to the extent feasible. This would include siting project components in previously disturbed areas (e.g., along existing roadways and ROW). Offshore wind projects would be required to comply with federal, state, and local regulations related to the protection of wetlands and other WOTUS, thereby avoiding and minimizing impacts. This includes compliance with the SPDES General Permit for Stormwater Discharges and an approved SWPPP to minimize impacts from disturbed sediments and implementing good housekeeping measures to minimize trash and debris in the work areas. The in-water work would be required to be conducted in accordance with NYSDEC permits for Excavation and Fill in Navigable Waters and Tidal Wetlands (dredging permits), CWA Section 404 Permit from USACE, and a Section 401 Water Quality Certification from NYSDEC. Mitigation for any lost wetlands or other WOTUS would be required if impacts could not be avoided or minimized.

3.13.3.3 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, BOEM would not approve the COP and proposed Project construction and installation, O&M, and decommissioning would not occur. Therefore, any potential impacts on wetlands and other WOTUS associated with the proposed Project would not occur. However, ongoing activities and environmental trends in the region would have continuing impacts on wetlands and other WOTUS. Activities would be required to comply with federal, state, and local regulations protecting wetlands and other WOTUS, thereby avoiding or minimizing impacts. Mitigation would be anticipated to compensate for wetland loss if impacts could not be avoided or minimized. BOEM anticipates that the impact on wetlands resulting from ongoing activities associated with the No Action Alternative would be **minor**.

Cumulative Impacts of the No Action Alternative

Planned activities other than offshore wind may also have impacts on wetlands including increased land disturbance from onshore construction. BOEM anticipates that the cumulative impact on wetlands resulting from planned activities associated with the No Action Alternative would be **moderate**.

Potential future offshore wind activities that would overlap the GAA could cause impacts similar to the impacts of the proposed Project. Activities would be required to comply with federal, state, and local regulations protecting wetlands and other WOTUS, thereby avoiding or minimizing impacts. If impacts would not be entirely avoided, mitigation would be anticipated for projects to compensate for the loss of wetlands. BOEM anticipates that the cumulative impact on wetlands resulting from potential future offshore wind activities associated with the No Action Alternative would be **moderate**.

Under the No Action Alternative, wetlands would continue to be impacted by environmental trends and activities associated with ongoing and planned activities, including offshore wind. BOEM anticipates that the overall impacts associated with Alternative A, the No Action Alternative, when combined with environmental trends and all other planned activities (including offshore wind) in the GAA would result in overall **moderate** cumulative impacts.

3.13.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on wetlands:

- The onshore transmission cable routing variants within the onshore Project Area.

An alternate onshore transmission cable route with fewer wetlands or other WOTUS within or adjacent to the right-of-way would have less potential for direct and indirect impacts on wetlands.

3.13.5 Impacts of Alternative B - Proposed Action on Wetlands and Other Waters of the United States

The IPFs associated with the onshore facilities that could directly or indirectly impact wetlands or other WOTUS include land disturbance, sediment suspension and deposition, discharges and releases, and noise disturbance. These IPFs have the potential to affect temporarily or permanently the condition or function of sensitive resources previously identified.

3.13.5.1 Construction and Installation

3.13.5.1.1 Onshore Activities and Facilities

Land disturbance: Construction and installation of onshore components may require excavation, grading, filling, and vegetation clearing and/or trimming. These activities may permanently or temporarily reduce, alter, or degrade wetland resources. The onshore transmission cable route includes crossing the ICW and Carmans River to reach the OnCS-DC. Additionally, this route runs parallel to or intersects with delineated freshwater and tidal wetlands listed in Table 3.13-3. The trenchless construction methods currently proposed are expected to avoid direct impacts to surface waters and wetlands; therefore, no wetlands or other WOTUS are expected to be directly impacted by construction and installation of the proposed Project's onshore components. Additionally, most of the construction associated with the installation of the onshore proposed facilities would occur within existing roadways to minimize associated land disturbances or conversion of terrestrial wetland habitats (APM GEN-01,). Installation technology was designed to minimize disturbances to sensitive habitats (i.e., wetlands) would be used to the extent practicable (APM GEN-04, APM GEN-05). Any disturbed areas in the proposed Project Area would be restored to pre-existing contours (maintaining natural surface drainage patterns) and allow vegetation to become reestablished once construction activities are completed, to the extent practicable (APM GEN-20). Sunrise Wind is currently evaluating locations and facilities to provide O&M support to the Project. These sites include existing ports across New York, New England, and the Mid-Atlantic. It is anticipated that any O&M facility site that is used would also support other offshore wind or maritime industries on the east coast. A major criterium for the location of the O&M facilities is the presence of existing infrastructure. Therefore, wetland impacts from the O&M facilities are expected to be avoided or minimized. A temporary landing structure (i.e., pile-supported trestle) may be installed at Smith Point County Park to aid in the offloading of equipment and materials required for onshore construction. The temporary landing structure may result in 0.02 ac (960 sq ft) of temporary impacts to tidal wetlands which includes the transition pad and up to 24 spuds, piles, or anchors which secure the landing structure to the seabed. An additional SAV survey was conducted in the area of the temporary landing at Smith Point County Park by Cornell Cooperative Extension (CCE) of Suffolk County on October 12, 2022 (detailed in the BOEM 2023 EFH Assessment). No SAV-forming patches or meadows were observed during the survey. However, eelgrass (*Zostera marina*) was identified at six different locations in the northeastern area of the proposed temporary landing site. Results from the survey indicate no significant populations of eelgrass in the proposed temporary landing site at Smith Point County Park. The structure would be positioned to avoid and minimize impacts to these sensitive

habitats to the extent practicable (APM GEN-04). If impacts occur during construction activities, they would be temporary, localized, and would be expected to recover completely (Sunrise Wind 2023). Table 3.13-3 provides a quantitative summary of anticipated impact to delineated wetlands and waterbodies by the Proposed Action component (Sunrise Wind 2023; Stantec 2022). Potential adverse impacts on wetlands would be short-term and localized. Due to the proposed construction methods and minimization measures, no permanent impacts to wetlands are anticipated and compensatory mitigation would likely not be necessary. The impact of land disturbance on wetlands resulting from the Proposed Action would be minor.

Table 3.13-3. Anticipated Impacts to Delineated Wetland and Waterbody Resources by Project Component

Project Component	Delineated Waterbody or Wetland Type/Number	Delineated Wetlands in Project Area (Acres)	Areal Extent of Potential Impact (Acres)	Areal Extent of Anticipated Impact (Acres)	Duration of Impact	Percent Impact Relative to Total Wetland Area
Landfall/ICW area/temporary landing structure	Estuarine/3	4.84	0.02	0.02	Temporary	0.20%
	Palustrine emergent/2	0.69	0	0^	N/A	N/A
Onshore transmission cable route	Lacustrine (Carmans River)/1	0.76	0	0^	N/A	N/A
	Riverine (Carmans River, unnamed perennial)/2	0.3	0.01	0*	N/A*	<0.01%
	Freshwater pond/1	0.38	0	0^	N/A	N/A
	Palustrine scrub shrub/1	0.07	0	0^	N/A	N/A
	Palustrine forested wetland/4	0.74	0	0^	N/A	N/A
Total		**7.78**	**0.03**	**0.02**		

Source: COP Table 4.4.1-5 (Sunrise Wind 2023) and COP Appendix L (Stantec 2022)

Notes: * No impacts, installed via HDD; ^ No impact, outside of work area

Sediment suspension and deposition: As described above, the waterbodies crossed by the proposed Project (Carmans River and ICW) would likely be crossed using trenchless installation methods. These methods are expected to avoid direct impact to wetlands and other WOTUS. All earth disturbances from construction activities would be conducted in compliance with the New York SPDES for stormwater discharges which would further minimize impacts from disturbed sediments into waterbodies. Additionally, an SWPPP, including erosion and sedimentation control BMPs and revegetation measures would be implemented to minimize potential water quality impacts from construction (APM GEN-20).

Any impacts are expected to be localized and temporary with water quality returning to pre-existing conditions soon after the cessation of construction activities (COP, Section 4.4.2.2, Sunrise Wind 2023).

Discharges and releases: Although no impacts for discharges and releases are anticipated, spill or accidental releases of fuels, lubricants, or hydraulic fluids could occur during construction activities. A SPCC Plan would be developed, and any discharges or release would be governed by NYS regulations (APM GEN-21). Additionally, where HDD is utilized, an Inadvertent Return Plan would be prepared and implemented to minimize the potential risks associated with release of drilling fluids (APM GEN-22). Any unanticipated discharges or releases within the onshore facilities during construction are expected to result in minor, temporary impacts; activities are heavily regulated, and discharges and releases are considered accidental events that are unlikely to occur (COP, Section 4.4.2.2, Sunrise Wind 2023). Good housekeeping practices would be implemented to minimize trash and debris in onshore work areas. These practices would include orderly storage of tools, equipment, and materials, as well as proper waste collection, storage, and disposal to keep work areas clean and minimize potential environmental impacts. All trash and debris returned to shore from offshore vessels would be properly disposed of or recycled at licensed waste management and/or recycling facilities. Disposal of any solid waste or debris in the water would be prohibited. With proper waste management procedures, the potential for trash or debris to be inadvertently introduced into wetland or other WOTUS is unlikely, and any impacts would be minor and temporary (COP, Section 4.4.2.2, Sunrise Wind 2023).

Noise: As described above, noise from offshore wind construction activities is not expected to be noticeable in onshore wetland habitats due to the distance to the offshore activities. However, noise from onshore activities, e.g., trenching and HDD of export cables and construction of other onshore facilities, would disturb and displace wetland fauna. Noise is anticipated intermittently during construction phases. Wildlife would be temporarily displaced but would have access to adjacent habitat and would repopulate work areas once construction ceases. However, noise pollution is a reported threat to wetland groups such as aquatic invertebrates (Hopson 2019) and road noise is a reported threat to birds (Hirvonen 2001). Construction is anticipated to occur within established ROWs where wildlife is absent or have been habituated to human activity and noise. Noise is not anticipated to cause any meaningful change to coastal habitats and fauna due to existing traffic and recreational noise. Therefore, impacts to fauna would be temporary and short-term resulting in negligible to minor impacts.

3.13.5.1.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.5.2 Operations and Maintenance

3.13.5.2.1 Onshore Activities and Facilities

Normal O&M activities are not expected to involve further wetland alterations. The onshore interconnection cable route and associated facilities generally have no maintenance needs unless a fault or failure occurs; therefore, O&M is not expected to affect wetlands or other WOTUS. Any non-routine maintenance may cause limited land disturbance and noise disturbance for temporary access to assess

damage and for repair or replacement of infrastructure, but any impact is expected to be short-term and negligible.

3.13.5.2.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.5.3 Conceptual Decommissioning

3.13.5.3.1 Onshore Activities and Facilities

Decommissioning of the onshore proposed Project components are anticipated to be similar to or less adverse than those described for construction. If impacts do occur during decommissioning, they would be short-term and localized.

3.13.5.3.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.5.4 Cumulative Impacts of the Proposed Action

In context of reasonably foreseeable environmental trends, the impacts on wetlands under the Proposed Action may add to the impacts of ongoing and future land disturbance, sediment suspension and deposition, discharges and releases, and noise. Impacts due to onshore land use changes are expected to include a gradually increasing amount of wetland alteration and loss. The future extent of land disturbance from ongoing activities and future non-offshore wind activities over the next 35 years is not known with as much certainty as the extent of land disturbance that would be cause by the Proposed Action but based on regional trends is anticipated to be similar to or greater than that of the Proposed Action. If a future project were to overlap the GAA or even be co-located (partly or completely) within the same right-of-way corridor that the Proposed Action would use, then the impacts of those future projects on wetlands would be of the same type as those of the Proposed Action alone; the degree of impacts may increase, although the location and timing of future activities would influence this. For example, repeated construction in a single right-of-way corridor would be expected to have less impact on wetlands than construction in an equivalent area of undisturbed wetland. Offshore wind projects would be required to comply with federal, state, and local regulations related to the protection of wetlands and other WOTUS, thereby avoiding and minimizing impacts. This includes compliance with the New York SPDES General Permit for Stormwater Discharges and an approved SWPPP to minimize impacts from disturbed sediments and implementing good housekeeping measures to minimize trash and debris in the work areas. The in-water work would be required to be conducted in accordance with NYSDEC permits for Excavation and Fill in Navigable Waters and Tidal Wetlands (dredging permits), CWA Section 404 Permit from USACE, and a Section 401 Water Quality Certification from NYSDEC. Mitigation for any lost wetlands or other WOTUS would be required if impacts could not be avoided or minimized. Therefore, in context of reasonably foreseeable environmental trends, combined land disturbance, sediment suspension and deposition, discharges and releases, and noise impacts on wetlands from ongoing and planned activities, including the Proposed Action, would likely be minimal.

3.13.5.5 Conclusions

Impacts of the Proposed Action

The activities associated with the Proposed Action may result in short-term impacts to wetlands or other WOTUS from activities within or adjacent to these resources. Due to proposed design and construction methods (e.g., constructing within existing ROWs, trenchless construction) direct impacts to surface waters and wetlands are mostly avoided. Because of the proposed Project design which includes avoidance, minimization measures, and mitigation measures required under federal and state statutes, BOEM expects the Proposed Action would likely have a **minor** adverse impact on wetlands and other WOTUS.

Cumulative Impacts of the Proposed Action

In the context of other ongoing and planned activities, the incremental contribution of the Proposed Action to the impacts of individual IPFs would be negligible to minor. Considering all the IPFs together, BOEM expects that the overall cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **moderate** adverse impacts to wetlands and other WOTUS. Measurable impacts from the Proposed Action would be small and contribute to the overall impact rating mainly through short-term impacts on wetlands from onshore construction activities adjacent to wetlands and other WOTUS. These resources would be expected to recover completely from these activities.

3.13.6 Alternative C-1 - Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

3.13.6.1 Construction and Installation

3.13.6.1.1 Onshore Activities and Facilities

All onshore Project components and construction and installation activities would be the same as the Proposed Action. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.6.1.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.6.2 Operations and Maintenance

3.13.6.2.1 Onshore Activities and Facilities

All onshore Project components and O&M activities would be the same as the Proposed Action. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.6.2.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.6.3 Conceptual Decommissioning

3.13.6.3.1 Onshore Activities and Facilities

All onshore proposed Project components and conceptual decommissioning activities would be the same as the Proposed Action. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.6.3.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.6.4 Cumulative Impacts of Alternative C-1

The cumulative impacts of Alternative C-1 considered the impacts of Alternative C-1 in combination with other planned onshore wind and other offshore activities. Cumulative impacts would be similar to those described for the Proposed Action.

3.13.6.5 Conclusions

Impacts of Alternative C-1

Because changes in the WTGs arrangement would not impact onshore wetlands and other WOTUS, BOEM expects that the adverse impacts resulting from Alternative C-1 would be the same as the Proposed Action: **minor**.

Cumulative Impacts of Alternative C-1

In the context of other ongoing and planned activities, the contribution of Alternative C-1 to the impacts of individual IPFs would be similar to the Proposed Action: negligible to minor. Considering all the IPFs together, the overall cumulative impacts of the alternatives when combined with past, present, and reasonably foreseeable activities would be the same as the Proposed Action and result in **moderate** adverse impacts to wetlands and other WOTUS.

3.13.7 Alternative C-2 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

3.13.7.1 Construction and Installation

3.13.7.1.1 Onshore Activities and Facilities

All onshore Project components and construction and installation activities would be the same as the Proposed Action. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.7.1.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.7.2 Operations and Maintenance

3.13.7.2.1 Onshore Activities and Facilities

All onshore Project components and O&M activities would be the same as the Proposed Action. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.7.2.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.7.3 Conceptual Decommissioning

3.13.7.3.1 Onshore Activities and Facilities

All onshore Project components and conceptual decommissioning activities would be the same as the Proposed Action. As such, the impact of this alternative would be the same as the Proposed Action

3.13.7.3.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.7.4 Cumulative Impacts of Alternative C-2

The cumulative impacts of Alternative C-2 considered the impacts of Alternative C-2 in combination with other planned onshore wind and other offshore activities. Cumulative impacts would be similar to those described for the Proposed Action.

3.13.7.5 Conclusions

Impacts of Alternative C-2

Since changes in the WTGs arrangement would not impact onshore wetlands and other WOTUS, BOEM expects that the adverse impacts resulting from Alternative C-2 would be the same as the Proposed Action: **minor**.

Cumulative Impacts of Alternative C-2

In the context of ongoing and planned activities, the incremental contribution of Alternative C-2 to the impacts of individual IPFs would be similar to the Proposed Action: negligible to minor. Considering all the IPFs together, the overall cumulative impacts of the alternatives when combined with past, present, and reasonably foreseeable activities would be the same as the Proposed Action and result in **moderate** adverse impacts to wetlands and other WOTUS.

3.13.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.13.8.1 Construction and Installation

3.13.8.1.1 Onshore Activities and Facilities

All onshore Project components and construction and installation activities would be the same as the Proposed Action under Alternative C-3. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.8.1.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.8.2 Operations and Maintenance

3.13.8.2.1 Onshore Activities and Facilities

All onshore Project components and O&M activities would be the same as the Proposed Action under Alternative C-3. As such, the impact of this alternative would be the same as the Proposed Action.

3.13.8.2.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.8.3 Conceptual Decommissioning

3.13.8.3.1 Onshore Activities and Facilities

All onshore Project components and conceptual decommissioning activities would be the same as the Proposed Action under Alternative C-3. As such, the impact of this alternative would be the same as the Proposed Action

3.13.8.3.2 Offshore Activities and Facilities

Offshore activities would not impact wetlands and other WOTUS.

3.13.8.4 Cumulative Impacts of Alternative C-3

The cumulative impacts of Alternative C-3 considered the impacts of Alternative C-3 in combination with other planned onshore wind and other offshore activities. Cumulative impacts of Alternative C-3 would be similar to those described for the Proposed Action.

3.13.8.5 Conclusions

Impacts of Alternative C-3

Since changes in the WTGs arrangement would not impact onshore wetlands and other WOTUS, BOEM expects that the adverse impacts resulting from Alternative C-3 would be the same as the Proposed Action: **minor**.

Cumulative Impacts of Alternative C-3

In the context of ongoing and planned activities, the incremental contribution of Alternative C-3 to the impacts of individual IPFs would be similar to the Proposed Action: negligible to minor. Considering all the IPFs together, the overall cumulative impacts of the alternatives when combined with past, present, and reasonably foreseeable activities would be the same as the Proposed Action and result in **moderate** adverse impacts to wetlands and other WOTUS.

3.13.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall negligible to minor adverse impacts on wetlands. Table 3.13-4 provides an overall summary of alternative impacts.

Table 3.13-4. Comparison of Alternative Impacts on Wetlands and Other Waters of the United States

No Action Alternative	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: BOEM expects that the impact on wetlands and other waters of the United States (WOTUS) resulting from ongoing activities associated with the No Action Alternative would be **minor** adverse. *Cumulative Impacts of the No Action Alternative:* BOEM anticipates that the overall cumulative impacts associated with the No Action Alternative, when combined with all other planned activities (including offshore wind) in the GAA would result in overall **moderate** adverse impacts.	*Proposed Action:* BOEM expects the impacts resulting for the Proposed Action alone would likely have **minor** adverse impact on wetlands and other WOTUS. *Cumulative Impacts of the Proposed Action:* Considering all the IPFs together, BOEM expects that the overall cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **moderate** adverse impacts to wetlands and other WOTUS.	*Alternative C-1:* Because changes in the WTGs arrangement would not impact onshore wetlands and other WOTUS, BOEM expects that the adverse impacts resulting from Alternative C-1 alone would be the same as the Proposed Action: **minor.** *Cumulative Impacts of Alternative C-1:* Considering all the IPFs together, the overall cumulative impacts of the alternatives when combined with past, present, and reasonably foreseeable activities would be the same as the Proposed Action and result in **moderate** adverse impacts to wetlands and other WOTUS.	*Alternative C-2:* Since changes in the WTGs arrangement would not impact onshore wetlands and other WOTUS, BOEM expects that the adverse impacts resulting from Alternative C-2 alone would be the same as the Proposed Action: **minor.** *Cumulative Impacts of Alternative C-2:* Considering all the IPFs together, the overall cumulative impacts of the alternatives when combined with past, present, and reasonably foreseeable activities would be the same as the Proposed Action and result in **moderate** adverse impacts to wetlands and other WOTUS.	*Alternative C-3:* Since changes in the WTGs arrangement would not impact onshore wetlands and other WOTUS, BOEM expects that the adverse Impacts resulting from Alternative C-3 alone would be the same as the Proposed Action: **minor**. *Cumulative Impacts of Alternative C-3:* Considering all the IPFs together, the overall cumulative impacts of the alternatives when combined with past, present, and reasonably foreseeable activities would be the same as the Proposed Action and result in **moderate** adverse impacts to wetlands and other WOTUS.

3.13.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. BOEM anticipates Alternative C-3b would have minor adverse impacts to wetlands and other WOTUS within the GAA. Overall cumulative impacts to wetlands from the Preferred Alternative combined with past, present, and reasonably foreseeable activities would be moderate adverse due to the short-term impacts on wetlands from onshore construction activities adjacent to wetlands and other WOTUS. These resources would be expected to recover completely from these activities.

3.13.11 Proposed Mitigation Measures

No additional measures to mitigate impacts on wetlands or other WOTUS have been proposed for analysis.

3.13.11.1 Effect of Measures Incorporated into the Preferred Alternative

Since no mitigation measures have been proposed, impact levels for the Preferred Alternative would remain as described above in Section 3.13.8.

3.16 Demographics, Employment, and Economics

This section discusses potential impacts on demographics, employment, and economics from the proposed Project, alternatives, and ongoing and planned activities in the GAA (Appendix D, Figure D-13). In the COP, it is not indicated that any single state or county would be the primary recipient of the Project's economic impacts, adverse or beneficial. Therefore, the Analysis Area used to evaluate the demographic, employment, and economic impacts of the proposed Project includes the states, counties, and communities that are in the vicinity of the proposed Project, include a port that may support a phase of the proposed Project, or are within the viewshed of the proposed Project.

Table 3.16-1 lists the communities, including the associated county/borough, where proposed onshore infrastructure and potential port cities are located, as well as the counties in closest proximity to the SRWF Lease Area. These are also assigned to an analysis area, either Primary or Expanded, depending on how potential Project impacts would be evaluated for that community. The Primary Analysis Area for demographics, employment, and economics is defined as the area where the Project would occur and where potential ports are located, which includes the states of New York, Connecticut, Maryland, Massachusetts, New Jersey, Rhode Island, and Virginia. The Expanded Analysis Area includes the communities within the potential viewshed of the SRWF. The potential for effects on property values and recreation/tourism are considered in the Expanded Analysis Area.

Table 3.16-1. States, Counties, and Communities within the Demographics, Employment and Economics Analysis Area

County/Borough	Communities	Analysis Area	
		Primary	Expanded
New York			
Suffolk	Town of Brookhaven Port Jefferson Village Fire Island Census Designated Place (CDP) Shirley CDP Mastic Beach CDP Brookhaven CDP Medford CDP North Bellport CDP North Patchogue CDP East Patchogue CDP Yaphank CDP Holtsville CDP Holbrook CDP	X	
	Town of East Hampton Montauk CDP	X	X
	Town of Southold		X
Albany	City of Albany Town of Coeymans Town of Bethlehem	X	
Kings County	Borough of Brooklyn	X	
New York County	New York City	X	
Connecticut			
New London	City of New London	X	
	Town of North Stonington Town of Stonington		X
Maryland			
Baltimore	Sparrows Point CDP (Edgemere) [a]	X	
Massachusetts			
Barnstable	Town of Falmouth Town of Mashpee		X
Bristol	City of New Bedford	X	X
	Town of Dartmouth Town of Fairhaven City of Fall River Town of Westport		X
Dukes	Town of Aquinnah Town of Chilmark Edgartown Community Town of Gosnold Town of Oak Bluffs Town of Tisbury Town of West Tisbury		X
Nantucket	Town of Nantucket		X
Plymouth	Town of Mattapoisett		X

County/Borough	Communities	Analysis Area	
		Primary	Expanded
New Jersey			
Gloucester	Paulsboro (borough) [b]	X	
Rhode Island			
Kent	East Greenwich West Greenwich		X
Newport	Jamestown Little Compton Middleton Newport Portsmouth Tiverton		X
Providence	City of Providence	X	
Washington	Village of Galilee Village of Point Judith Quonset Point Community	X	
	Town of Charleston Town of Exeter Town of Hopkinton Town of New Shoreham Town of Richmond Town of South Kingstown Town of Westerly		X
	Town of Narragansett Town of North Kingstown	X	X
Virginia			
City of Norfolk	City of Norfolk [c]	X	

Notes:

[a] Edgemere, MD is the (geographically) closest residential area to Sparrow's Point. This area is an unincorporated community and Census Designated Place (CDP) in Baltimore County.

[b] This study used the Borough of Paulsboro for census data. The Borough of Paulsboro includes the community of Billingsport, NJ.

[c] This study used the city of Norfolk and Norfolk International Terminals as the locations for this community and port, respectively. The city of Norfolk is considered a county-equivalent area according to the United States Census Bureau (USCB).

The Primary Analysis Area includes existing ports that are being evaluated to support construction and O&M of the Project, which are listed along with potential project port activities in Table 3.16-2. The COP (Sunrise Wind 2023a) states that "no final determination has been made concerning the specific location(s) of these activities, which could take place at various locations and are expected to serve multiple offshore wind projects and potentially multiple offshore wind related and other maritime industries."

Table 3.16-2. Potential Port Facilities

State	Port	City/Town, County	Summary of Potential Activities				
			WTG Tower, Nacelle, and Blade Storage, Pre-Commissioning, and Marshalling	Foundation Marshalling and Advanced Foundation Component Fabrication	O&M Activities	Construction Base	Electrical Activities and Support
Connecticut	Port of New London	New London, New London County	X				
Massachusetts	New Bedford Marine Commerce Terminal	New Bedford, Bristol County	X				
Maryland	Sparrows Point	Sparrows Point, Baltimore County		X			
New Jersey	Paulsboro Marine Terminal	Paulsboro, Gloucester County		X			
New York	Port of Albany	Albany, Albany County		X			
	Port of Brooklyn	Brooklyn, Kings County			X		
	Port of Coeymans	Coeymans, Albany County		X			
	Port Jefferson	Port Jefferson Village, Suffolk County			X		
	Port of New York	New York City, New York County					X
	Port of Montauk	Montauk, Suffolk County			X		
Rhode Island	Port of Providence	Providence, Providence County	X	X			X
	Port of Davisville and Quonset Point	North Kingstown, Washington County			X	X	
	Port of Galilee	Narragansett, Washington County			X		
Virginia	Port of Norfolk	Norfolk, Norfolk County	X				

3.16.1 Description of the Affected Environment and Future Baseline Conditions

Demographic Characteristics within the Primary Analysis Area

This section describes the demographic characteristics and trends in the Primary Analysis Area. Table 3.16-3 describes each potentially affected state, county, and city/town by the following metrics: square miles; population in 2000, 2010, and 2018; population density; population change from 2000-2018; and median age.

Among the counties within the Primary Analysis Area, Kings County (Brooklyn), NY had the largest population in 2018 (approximately 2.6 million), followed by New York County (Manhattan) with approximately 1.6 million, and then by Suffolk County (approximately 1.5 million). Among the municipalities (cities and towns), aside from New York City, the Town of Brookhaven, NY had the largest population (484,671) (USCB 2018a). New York City (including Brooklyn and Manhattan) has by far the highest population density with 28,111 persons per mi^2, followed by the City of Providence, RI with 9,747 persons per mi^2. Albany, NY; North Patchogue, NY; New London, CT; New Bedford, MA; and Norfolk, VA also have significant population densities, each with between approximately 3,800 and 4,800 persons per mi^2.

Table 3.16-4 also lists the percent change between the decennial census taken in 2000 and the 2014 to 2018 American Community Survey (ACS) 5-Year Estimates and shows the changes in population over the same time period. Since 2000, for areas in New York, the change in population within the Primary Analysis Area ranges from a decrease of 20 percent in Fire Island, NY to an increase of 29 percent in North Bellport, NY. Albany County and North Bellport, NY experienced the most dramatic population changes for this period (27 and 29 percent increase, respectively). The median age throughout the Primary Analysis Area ranges from a low of 30 in the City of Providence, RI and 31 in Albany, NY, New London, CT, and Norfolk, VA to a high of 54 in Montauk, NY.

The median age across these municipalities ranged from the low 30s in some of the more urban areas and cities (i.e., Albany, New London, Providence) to the low- to mid-50s in areas on the eastern end of Long Island where there are more retirees (i.e., Montauk and East Hampton).

Table 3.16-3. Demographic Characteristics within the Primary Analysis Area

Entity	Land Area in miles^2 (km^2) [a]	Decennial Census Population Count (2000)	Decennial Census Population County (2010)	ACS Population Estimate (2018)	Population Density per mi^2 (2018) [b]	% Population Change (2000 – 2018)	ACS Median Age (2018)
New York	47,126 (122,059)	18,976,457	19,378,102	19,618,453	416	3	39
Suffolk County	912 (2,363)	1,419,369	1,493,350	1,487,901	1,632	5	41
Town of Brookhaven	259 (671)	448,248	486,040	484,671	1,869	8	40
Port Jefferson Village	3 (8)	7,837	7,750	7,871	2,574	0	46
Fire Island CDP	9 (23)	310	292	249	27	-20	42
Shirley CDP	11 (28)	25,395	27,854	28,698	2,502	13	36
Mastic Beach CDP	5 (13)	11,543	12,930	11,953	2,532	4	39
Brookhaven CDP	6 (16)	3,570	3,451	3,531	609	-1	50
Medford CDP	11 (28)	21,985	24,142	24,247	2,245	10	41
North Bellport CDP	5 (13)	9,007	11,545	11,593	2,367	29	33
North Patchogue CDP	2 (5)	7,825	7,246	7,561	3,832	-3	38
East Patchogue CDP	8 (21)	20,824	22,469	22,637	2,720	9	42
Yaphank CDP	14 (36)	5,025	5,945	6,390	468	27	38
Holtsville CDP	7 (18)	17,006	19,714	19,365	2,724	14	44
Holbrook CDP	7 (18)	27,512	27,195	26,286	3,664	-4	42

Entity	Land Area in miles^2 (km^2) [a]	Decennial Census Population Count (2000)	Decennial Census Population County (2010)	ACS Population Estimate (2018)	Population Density per mi^2 (2018) [b]	% Population Change (2000 – 2018)	ACS Median Age (2018)
Town of East Hampton	74 (192)	19,719	21,457	21,903	295	11	52
Montauk CDP	18 (47)	3,851	3,326	3,655	209	-5	54
Albany County	523 (1,355)	294,565	304,204	307,426	588	4	38
City of Albany	21 (54)	95,658	97,856	97,889	4,574	2	31
Town of Coeymans	50 (129)	8,151	7,418	7,363	147	-10	43
Town of Bethlehem	49 (127)	31,304	33,656	34,888	712	11	43
New York County	23 (60)	1,537,195	1,585,873	1,632,480	72,053	6	37
New York City	300 (777)	8,008,278	8,175,133	8,443,713	28,111	5	37
Kings County	68 (179)	2,465,326	2,504,700	2,600,747	27,490	5	35
Connecticut	**4,842 (12,540)**	**3,405,565**	**3,574,097**	**3,581,504**	**740**	**5**	**41**
New London County	665 (1,722)	259,088	274,055	268,881	404	4	41
City of New London	6 (16)	25,671	27,620	27,032	4,809	5	31
Maryland	**9,711 (25,151)**	**5,296,486**	**5,773,552**	**6,003,435**	**618**	**13**	**39**
Baltimore County	598 (1,549)	754,292	805,029	827,625	1,383	10	39
Sparrows Point (Edgemere CDP)	11 (28)	9,248	8,669	8,633	795	-7	46

Entity	Land Area in miles^2 (km^2) [a]	Decennial Census Population Count (2000)	Decennial Census Population County (2010)	ACS Population Estimate (2018)	Population Density per mi^2 (2018) [b]	% Population Change (2000 – 2018)	ACS Median Age (2018)
Massachusetts	**7,801 (20,205)**	**6,349,097**	**6,547,629**	**6,830,193**	**876**	**8**	**39**
Bristol County	553 (1,432)	534,678	548,285	558,905	1,011	5	41
City of New Bedford	20 (52)	93,768	95,072	95,117	4,757	1	37
New Jersey	**7,354 (19,047)**	**8,414,350**	**8,791,894**	**8,881,845**	**1,208**	**6**	**40**
Gloucester County	895 (2,318)	254,673	288,288	290,852	903	14	40
Borough of Paulsboro	2 (5)	6,160	6,097	5,937	3,085	-4	45
Rhode Island	**1,034 (2,678)**	**1,048,319**	**1,052,567**	**1,056,611**	**1,022**	**1**	**40**
Providence County	410 (1,062)	621,602	626,667	634,533	1,550	2	37
City of Providence	18 (47)	173,618	178,042	179,435	9,747	3	30
Washington County	329 (852)	123,546	126,979	126,242	383	2	45
Town of Narragansett	14 (36)	16,361	15,868	15,550	1,122	5	46
Town of North Kingston	43 (111)	26,326	26,486	26,207	607	-0.5	46
Virginia	**39,482 (102,258)**	**7,078,515**	**8,001,024**	**8,413,774**	**213**	**19**	**38**
City of Norfolk [c]	53 (137)	234,403	242,803	245,592	4,610	5	31

Sources: USCB 2000, 2010, 2018a, 2019

USCB = U.S. Census Bureau; ACS = American Community Survey; CDP = Census Designated Place; km^2 = square kilometers

Notes:

[a] Rounded to the nearest mi^2

[b] Values from USCB and may not be computed from table due to rounding.

[c] Norfolk is a county-equivalent area according to the USCB.

Additional demographic characteristics for the municipalities in the Primary Analysis Area are presented under employment and economics within this section, as well as within Section 3.17, *Environmental Justice*, as it relates to race/ethnicity and low-income characteristics.

Employment Characteristics within the Primary Analysis Area

Employment characteristics for states and counties in the Primary Analysis Area are summarized in Table 3.16-4. Among the counties, Kings County, NY has the largest labor force with approximately 1.2 million workers (as of 2018), while Washington County, RI has the smallest labor force with approximately 69,000 workers (USBLS 2020). Unemployment rates are low throughout the Primary Analysis Area (excluding states) and range from 3.6 percent in the Washington County, RI and the city of Norfolk, VA to a high of 4.4 percent in Providence County, RI. Per capita personal income in 2017 ranged from $40,094 in Norfolk, VA to $65,758 in Suffolk County, NY (excluding New York County [Manhattan], which had the highest per capita personal income at $175,960) (BEA 2018). At the state level, the labor force is largest in New York (more than 9.5 million workers) and smallest in Rhode Island (557,000 workers).

Table 3.16-4. Employment Characteristics for States and Counties within the Primary Analysis Area

Entity	Labor Force (2018)	Employment (2018)	Unemployment (2018)	Unemployment Rate (%) (2018)	Per Capita Personal Income ($) (2017)
New York	**9,542,000**	**9,147,000**	**395,000**	**4.1**	**64,540**
Albany County	157,500	151,700	5,800	3.7	58,048
Kings County	1,201,400	1,149,800	51,600	4.3	48,758
New York County	914,200	880,100	34,100	3.7	175,960
Suffolk County	777,784	747,832	29,952	3.9	65,758
Connecticut	**1,898,000**	**1,819,000**	**79,000**	**4.1**	**71,823**
New London County	137,463	132,032	5,431	4.0	56,725
Maryland	**3,184,000**	**3.051,000**	**132,000**	**4.2**	**60,847**
Baltimore County	450,366	432,164	18,202	4.0	59,130
Massachusetts	**3,823,000**	**3,693,000**	**130,000**	**3.4**	**67,630**
Bristol County	302,918	289,955	12,963	4.3	51,298
New Jersey	**4,418,000**	**4,232,000**	**186,000**	**4.2**	**64,537**
Gloucester County	147,175	140,940	6,235	4.2	52,506
Rhode Island	**557,000**	**534,000**	**23,000**	**4.1**	**52,786**
Providence County	325,587	311,259	14,328	4.4	46,470
Washington County	69,005	66,529	2,476	3.6	62,357
Virginia	**4,352,000**	**4,224,000**	**127,000**	**2.9**	**55,105**
City of Norfolk [a]	111,524	107,496	4,028	3.6	40,094

Sources: BEA 2018; USBLS 2019, 2020; Connecticut Department of Labor 2018; Rhode Island Department of Labor and Training 2019a, 2019b, 2019c; New York State Department of Labor 2019; Massachusetts Executive Office of Labor and Workforce Development 2019.

Note:

[a] Norfolk is a county-equivalent area according to the U.S. Census Bureau.

Housing Characteristics within the Primary Analysis Area

The areas along the coast, which include many of the jurisdictions within the Primary Analysis Area, oftentimes have tourism and visitor-centric economies, and also have seasonal housing that may be present. Therefore, the population during certain times of the year may increase with seasonal visitors to these homes or vacation rentals. This is especially true in areas of eastern Long Island, such as the municipalities of Montauk and Town of East Hampton but includes several other areas and jurisdictions as well. Table 3.16-5 presents housing data for the Primary Analysis Area, and includes total housing units, vacant units (for both owner-occupied and rentals) and median house values and median gross rent.

Table 3.16-5. Housing Characteristics within the Primary Analysis Area

Entity	Housing Units	Vacant Housing Units	Homeowner Vacancy Rate (%)	Rental Vacancy Rate (%)	Median Value ($)	Median Gross Rent ($)
New York	**8,287,087**	**970,550**	**1.7**	**4.3**	**302,200**	**1,240**
Suffolk County	575,162	87,181	1.4	5.7	386,800	1,698
Town of East Hampton	22,035	13,029	0.8	14.6	850,000	1,867
Montauk CDP	4,631	3,251	0.8	50.9	890,200	2,302
Town of Brookhaven	175,772	15,170	1.3	4.7	338,800	1,736
Port Jefferson Village	3,230	200	0.0	0.0	501,700	1,794
Brookhaven CDP	1,242	118	0.7	0.0	421,200	1,352
Holbrook CDP	9,353	499	0.0	5.2	364,700	1,906
Holtsville CDP	6,843	289	0.5	6.1	355,800	1,642
East Patchogue CDP	8,641	393	0.5	1.5	321,200	1,407
Fire Island CDP	3,473	3,397	2.9	0.0	425,000	N/A
Mastic Beach CDP	4,915	798	4.7	2.0	212,200	1,791
Medford CDP	8,328	372	0.6	0.0	311,200	1,965
North Bellport CDP	3,830	300	0.0	6.1	277,000	2,143
North Patchogue CDP	2,484	87	2.3	0.0	300,400	1,541
Shirley CDP	9,150	744	2.6	0.0	259,900	2,088
Yaphank CDP	2,063	69	0.0	5.1	311,300	2,125
Albany County	140,830	14,822	1.7	4.7	218,100	993
City of Albany	48,625	7,418	3.6	5.8	173,300	951
Town of Bethlehem	14,830	727	0.6	5.9	269,900	1,185
Town of Coeymans	3,458	400	2.8	7.8	178,700	854
New York City	3,472,354	318,251	1.9	3.4	570,500	1,396
Kings County	1,035,746	84,890	1.7	3.4	665,300	1,374
New York County	874,237	116,104	2.6	4.6	944,600	1,682
Connecticut	**1,512,305**	**144,931**	**1.8**	**6.5**	**272,700**	**1,156**
New London County	123,001	15,599	2.6	5.1	239,000	1,099
City of New London	12,645	1,670	4.7	5.2	181,300	958
Maryland	**2,437,740**	**245,222**	**1.7**	**6.2**	**305,000**	**1,357**
Baltimore County	336,554	23,641	1.7	6.7	255,400	1,263
Sparrows Point (Edgemere CDP)	3,539	281	1.8	1.1	274,400	1,322

Entity	Housing Units	Vacant Housing Units	Homeowner Vacancy Rate (%)	Rental Vacancy Rate (%)	Median Value ($)	Median Gross Rent ($)
Massachusetts	**2,882,739**	**280,825**	**1.0**	**3.8**	**366,800**	**1,225**
Bristol County	234,458	17,840	1.2	4.8	290,100	872
City of New Bedford	43,262	4,020	1.5	6.5	218,100	819
New Jersey	**3,605,401**	**392,039**	**1.7**	**5.2**	**327,900**	**1,295**
Gloucester County	113,024	8,437	1.3	6.8	216,700	1,186
Borough of Paulsboro	3,137	585	0.0	8.9	112,700	1,039
Rhode Island	**467,412**	**56,527**	**1.8**	**5.8**	**249,800**	**981**
Providence County	265,991	27,820	2.1	6.1	223,600	945
City of Providence	72,860	11,222	3.0	7.3	192,100	972
Washington County	63,737	14,626	1.6	5.8	328,300	1,100
Town of Narragansett	10,156	3,478	2.7	4.4	418,600	1,532
Town of North Kingston	11,513	1,101	0.9	4.7	340,600	983
Virginia	**3,491,091**	**362,676**	**1.6**	**5.7**	**264,900**	**1,202**
City of Norfolk [a]	97,257	9,102	2.9	6.4	199,400	1,031

Source: USCB 2018c

Note: [a] Norfolk is a county-equivalent area according to the United States Census Bureau.

As shown in Table 3.16-5, median home values in the communities within the Primary Analysis Area range from approximately $173,300 in Albany, NY and $179,000 in Coeymans, NY to $890,000 in Montauk, NY and $944,600 in Manhattan. At $192,100, the median home value in the City of Providence, RI is similar to that in the City of New London, CT ($181,300), while the Towns of North Kingstown and Narragansett in Rhode Island have median home values ($340,600 and $418,600, respectively) nearly or more than double that of the City of New London, CT. New Bedford, MA and Norfolk VA, had slightly higher median home values compared to the City of Providence, RI and the City of New London, CT. These trends are similar with regard to median gross rent, with Montauk, NY having the highest value ($2,302) and Coeymans, NY the lowest value ($854). The City of Providence, RI ($972) and New London, CT ($958) also have similar values, and the Towns of Narragansett and North Kingstown in Rhode Island ($1,352 and $983, respectively) have higher values (USCB 2018a). The median reported gross rent is slightly higher in the Town of East Hampton, NY compared to the Town of Brookhaven, NY ($1,867 and $1,736, respectively). Property values within the Primary and Expanded Analysis Area are further discussed below.

The vacancy status provides insight into the overall housing market and the analysis area's ability to accommodate non-local construction workers with short-term, rental accommodations. Table 3.16-6 provides additional housing statistics, specific to vacant housing units and their type of vacancy, which would allow for identification of units that could be available to non-local construction or O&M workers

by state and county. This table illustrates the key role that "seasonal, recreational, or occasional use" and "other vacant" units play in the local housing supply. For the Primary Analysis Area, these two occupancy uses comprise more than half the vacant units in nearly all of the counties (exceptions being Baltimore County, MD and the city of Norfolk, VA). For certain counties, such as Suffolk County, NY and Washington County, RI, it accounts for the vast majority of the vacant units, at 86-percent and 90-percent, respectively. Both "seasonal, recreational, or occasional use" and "other vacant" uses are associated with seasonal tourism or secondary vacation homes, with other vacant units often being used by a caretaker or janitor. As a result, the availability of seasonal units in many of these communities would typically be very limited during peak summer construction periods.

For communities with ports identified to support the O&M phase of the project, it would be expected that there would be fewer non-local construction workers in the area than other potential port locations.

As indicated in the table, the number of rental vacancies that may be available for migrant workers is limited, other housing options would be short-term accommodations, such as hotel and motel rooms and sites for recreational vehicles, and the need would primarily be associated with the communities around staging ports supporting construction activities, as well as construction of onshore facilities (as noted in the COP, much of the workforce for offshore construction would be housed offshore; Sunrise Wind 2023a).

Table 3.16-6. Vacant Housing Statistics within the Primary Analysis Area

Entity	Total Vacant Units [a]	For Rent	For Sale Only	For Seasonal, Recreational or Occasional Use	For Migrant Workers	Other Vacant
New York	**890,510**	**152,802**	**68,359**	**342,825**	**2,331**	**324,193**
Suffolk County	82,703	5,878	5,615	53,539	405	17,266
Suffolk County % Distribution [b]	–	*7*	*7*	*65*	*<1*	*21*
Albany County	13,157	2,690	1,237	1,707	0	7,523
Albany County % Distribution [b]	–	*20*	*9*	*13*	*0*	*57*
Kings County	84,890	23,723	4,942	9,230	49	36,267
Kings County % Distribution [b]	–	*28*	*6*	*11*	*0*	*43*
New York County	116,104	27,668	4,929	45,970	195	23,736
New York County % Distribution [b]	–	*24*	*4*	*40*	*0*	*20*
Connecticut	**131,961**	**31,889**	**16,808**	**29,855**	**93**	**53,316**
New London County	14,399	1,932	1,877	5,083	0	5,507
New London County % Distribution [b]	–	*13*	*13*	*35*	*0*	*38*
Maryland	**229,303**	**48,476**	**25,716**	**59,900**	**211**	**95,000**
Baltimore County	21,607	7,755	3,591	1,170	31	9,060
Baltimore County % Distribution [b]	–	*36*	*17*	*5*	*0*	*42*
Massachusetts	**254,652**	**39,087**	**16,817**	**127,508**	**84**	**71,156**
Bristol County	16,597	4,062	1,702	2,836	23	7,974
Bristol County %Distribution [b]	–	*21*	*20*	*24*	*2*	*34*
New Jersey	**366,466**	**63,742**	**35,674**	**135,527**	**231**	**131,272**
Gloucester County	7,634	1,507	1,132	271	0	4,724
Gloucester County % Distribution [b]	–	*20*	*15*	*4*	*0*	*62*
Rhode Island	**52,004**	**10,059**	**4,620**	**17,699**	**0**	**19,626**
Providence County	24,820	7,161	2,716	1,297	0	13,646
Providence County % Distribution [b]	–	*29*	*11*	*5*	*0*	*55*
Washington County	14,189	769	580	11,129	0	1,711

Entity	Total Vacant Units [a]	For Rent	For Sale Only	For Seasonal, Recreational or Occasional Use	For Migrant Workers	Other Vacant
Washington County % Distribution [b]	–	*5*	*4*	*78*	*0*	*12*
Virginia	**329,152**	**63,404**	**33,483**	**88,357**	**370**	**143,538**
Norfolk	8,420	3,426	1,150	438	0	3,406
Norfolk % Distribution [b]	–	*41*	*14*	*5*	*0*	*40*

Sources: USCB 2018c

Notes:

[a] Not including those rented or sold.

[b] Percent distribution reflects the distribution of the total number of vacant units in each county by type of vacancy (e.g., tenure).

Property Values within the Expanded Analysis Area

The Expanded Analysis Area has a substantial geographic reach when considering potential project impacts. This seven-state area also has a wide range of housing characteristics, including property values. The median home values in the communities within the Primary Analysis Area were presented in Table 3.16-5, and Table 3.16-7 below presents additional information with respect to both the Primary Analysis Area and the Expanded analysis area. As noted in Section 3.16.1, the Expanded Analysis Area is being considered mostly as it relates to potential visual impacts and the correlation to property values. Therefore, this additional information is being provided on the Expanded Area of Analysis. Table 3.16-7 presents the range of home values in 2018 and the percent distribution of homes within those ranges.

Among the counties within the Primary and Expanded Analysis Area, each has less than 10 percent of their owner-occupied housing unit values between $0 and $99,999 (USCB 2018c). Conversely, the percentage of units valued at $500,000 or greater spanned a much larger range from three percent in Gloucester County, NJ to 90 percent in Nantucket County, MA (USCB 2018c), indicating some counties are wealthier than others. At the state level, as noted in Table 4.7.1-9 of the COP (Sunrise Wind 2023a), New York and Massachusetts have a quarter or more of their owner-occupied housing unit values at greater than $500,000. Maryland, New Jersey, and Virginia each have about one-fifth of their owner-occupied housing units in that highest category, indicating similar wealth of the housing stock. Connecticut and Rhode Island have lesser percentages of their units valued at greater than $500,000 (17 and 11 percent, respectively) (USCB 2018c).

Table 3.16-7. Housing Values and Percent Distribution within the Counties in the Primary and Expanded Region of Interest

	Albany, NY	Kings, NY	New York, NY	Suffolk, NY	New London, CT	Baltimore, MD	Barnstable, MA	Bristol, MA	Dukes, MA	Nantucket, MA	Plymouth, MA	Gloucester, NJ	Kent, RI	Newport, RI	Providence, RI	Washington, RI	Norfolk, VA
Total Number of Owner-Occupied Housing Units	71,253	285,330	182,949	390,897	71,459	205,641	74,991	135,377	4,930	2,576	141,482	83,845	48,097	21,849	127,394	36,608	38,029
$0 to $99,999 (%)	9	4	4	3	7	6	2	4	1	1	4	7	6	4	6	3	8
$100,000 to $124,999 (%)	5	1	1	1	5	4	1	2	<1	<1	1	5	4	2	4	2	8
$125,000 to $149,999 (%)	7	1	<1	1	5	5	1	2	<1	1	1	8	6	1	7	1	9
$150,000 to $174,999 (%)	11	1	1	2	11	9	2	5	0	<1	3	13	12	3	13	3	13
$175,000 to $199,999 (%)	11	1	<1	2	9	8	2	6	<1	<1	3	11	13	2	11	4	13
$200,000 to $249,999 (%)	21	3	1	6	17	18	7	18	2	1	11	19	21	10	21	14	18
$250,000 to $299,999 (%)	13	3	2	11	15	13	12	18	1	1	13	15	13	11	13	17	10
$300,000 to $399,999 (%)	15	9	5	29	17	17	28	24	11	3	27	15	15	23	15	27	9
$400,000 to $499,999 (%)	5	11	10	19	7	9	17	12	14	3	15	4	6	15	6	12	5
$500,000 to $749,999 (%)	3	27	18	17	5	9	17	8	32	17	15	2	4	16	4	11	5
$750,000 to $999,999 (%)	1	17	14	6	2	2	6	2	21	19	5	<1	2	6	1	4	2
$1,000,000 to $1,499,999 (%)	<1	13	14	2	1	1	3	1	8	23	2	<1	<1	4	<1	2	1
$1,500,000 to $1,999,999 (%)	<1	5	8	1	<1	<1	1	<1	4	9	1	<1	<1	1	<1	1	<1
$2,000,000 or more (%)	<1	6	24	1	<1	<1	1	<1	7	22	1	<1	<1	2	<1	1	<1
$500,000 or more (%)	4	68	79	27	8	12	29	11	72	90	24	3	6	30	6	19	8

Source: USCB 2018a

Note: Norfolk is a county-equivalent area according to the United States Census Bureau.

Economic Characteristics within the Primary Analysis Area

The Gross Domestic Product (GDP) represents the market value of goods and services produced by the labor and property located within a geographic area and is influenced to a large degree by the size of that area. GDP serves as a relative indicator of the size of the economies within the region, particularly when viewed as a percentage of the overall national economy. Table 3.16-8 summarizes the GDP for all states within the Analysis Area for the most recent years for which data are available. New York has the highest GDP of all the states in the Analysis Area. Maryland, Massachusetts, New Jersey, and Virginia have relatively similar GDPs that are all less than New York, while Connecticut and Rhode Island have the smallest GDPs of all states within the Analysis Area (BEA 2022).

Table 3.16-8. Current-Dollar Gross Domestic Product by State for 2020 and 2021

Entity	GDP (in millions of current dollars)		2020 – 2022 % Change	Percent of the US GDP	
	2020	2021 (Preliminary Statistics)		2020	2021
United States	**20,893,746**	**22,996,086**	**10.1%**	-	-
New York	1,724,759	1,853,926	7.5%	8.3%	8.1%
Connecticut	276,423	296,498	7.3%	1.3%	1.3%
Maryland	410,675	438,235	6.7%	2.0%	1.9%
Massachusetts	582,477	636,514	9.3%	2.8%	2.8%
New Jersey	618,579	672,089	8.7%	3.0%	2.9%
Rhode Island	60,556	65,939	8.9%	0.3%	0.3%
Virginia	549,536	591,851	7.7%	2.6%	2.6%

Source: BEA 2022

Table 3.16-9. Percent Employed Civilian Population by Industry in the States in the Primary Region of Interest

Industry	Percent Employed										
	Albany, NY	Suffolk, NY	NYC, NY [a]	New London, CT	Baltimore, MD	Bristol, MA	Gloucester, NJ	Newport, RI	Providence, RI	Washington, RI	Norfolk, VA [b]
Agriculture, forestry, fishing, hunting, mining	<1	1	<1	1	<1	<1	1	1	<1	1	<1
Construction	4	8	5	6	6	7	7	7	5	6	8
Manufacturing	5	7	3	13	5	11	8	7	12	10	7
Wholesale trade	2	3	2	2	2	3	4	2	2	2	2
Retail trade	10	12	9	11	11	13	11	9	13	11	12
Transportation and warehousing, and utilities	4	6	6	4	5	4	6	3	4	3	5
Information	2	3	4	2	2	2	2	2	2	1	2
Finance and insurance, real estate, rental and leasing	7	7	10	5	8	6	7	7	7	6	6
Professional, scientific, management, and administrative and waste management services	11	12	14	9	13	9	11	12	10	10	11
Education services, and health care and social assistance	28	27	27	24	27	27	28	27	27	28	23
Arts, entertainment, recreation, food services, accommodation	9	7	11	15	8	9	7	13	10	13	13
Other services, except public administration	5	4	5	4	5	4	4	6	5	4	5
Public administration	12	5	4	5	8	4	5	5	4	4	9

Source: USCB 2018b

Notes:

a Includes Kings and New York Counties.

b Norfolk is considered a county-equivalent area according to the United States Census Bureau.

BOEM identified coastal counties (and in several cases, hotspots within particular counties) along the US east coast, from Maine to Georgia, as a function of their potential to experience socioeconomic impacts, both beneficial and detrimental, associated with each phase (planning, construction, and decommissioning) of wind facility development (ICF 2012).

Criteria used to rank and evaluate the potential sensitivity of coastal areas of interest to offshore wind development included counties where:

- Ocean recreation and tourism account for a sizable percentage of the location's tourism economy;
- Ocean recreation and tourism account for a sizable percentage of the location's marine economy;
- Tourism accounts for a large percentage of the location's economy;
- The location has a large number of establishments related to coastal and water recreation;
- The location has a high percentage of natural or historic and cultural areas; and
- The location has significant development along the coast (ICF 2012).

Of the 113 geographic areas (i.e., counties and hotspots within particular counties) originally identified for analysis, 14 coincided with counties that were either in the Primary or Expanded Analysis Area for this Project. The three that were not included in BOEM's original list included Baltimore County, MD, Gloucester County, NJ, and Albany County, New York. Based on the methodology presented by ICF (2012), the recreation and tourism industries in these counties are less likely to be sensitive to offshore wind development as compared to those included in BOEM's assessment, likely because they are located further inland from the coast, or were not located in proximity to an area considered for offshore wind development.

Ultimately, a scorecard analysis was performed on the original 113 geographies identified, and the highest ranked 70 were chosen to move forward and analyze with community profiles. Those that were also counties within the Primary and/or Expanded Analysis Area included Suffolk, Kings, and New York counties, NY; New London County, CT; Barnstable, Bristol, Dukes, Nantucket, and Plymouth counties, Massachusetts; and Kent, Newport, Providence and Washington counties, RI, and the community profiles are included in Appendix E of the ICF 2012 report.

Information relative to the "ocean economy" is also available and tracked via NOAA's Office for Coastal Management – DIGITALCOAST program. The Economics: National Ocean Watch (ENOW) tool streamlines obtaining and comparing data for the six sectors depended on the ocean and Great Lakes, which includes: (1) living resources, (2) marine construction, (3) marine transportation, (4) offshore mineral resources, (5) ship and boat building, and (6) tourism and recreation (NOAA 2018, 2022).

Table 3.16-10 summarizes the significance of the ocean economy, including ocean-related tourism and recreation, to each geography within the Expanded Analysis Area. Gloucester County, NJ had the lowest percentage of ocean-related tourism jobs (27.5 percent), followed by New London County, CT (36.2 percent), while Nantucket County, Massachusetts had the highest percentage of ocean-related tourism jobs (99.5 percent) (with relatively few establishments). The number of employees per ocean-related establishment was far higher in Gloucester and New London Counties (approximately 43 and 38, respectively) than in the other counties within the Expanded Analysis Area (ranging from approximately

nine in Dukes County, Massachusetts to 23 in Washington County, RI) (ICF 2012). In terms of ocean-related GDP from tourism and recreation, the total value of goods produced and services provided in the ocean-related tourism and recreation economy was most significant in Suffolk County, NY ($1.9 billion), followed by $1.1 billion in Barnstable County, MA, and least significant in Gloucester County, NJ ($52.3 million). Collectively, the counties of had a combined GDP of nearly $1.8 billion. Additional recreation and tourism details are provided in Section 3.21 *Recreation and Tourism*.

Table 3.16-10. Summary of Ocean-Related Tourism Indicators within the Expanded Analysis Area (2018)

County in the Expanded Analysis Area	Ocean Jobs Related to Tourism and Recreation (%)	Ocean Establishments Related to Tourism and Recreation	Ocean-related Establishments/ Employment	Ocean-related GDP from Tourism and Recreation (in millions of $)
New York				
Albany County	N/A	N/A	38/625	N/A
Kings County	91.9	3,759	3,997/38,536	1,800
New York County	99.1	9,621	9,782/221,081	22,200
Suffolk County	87.9	2,741	3,032/43,138	1,900
Connecticut				
New London County	36.2	490	541/20,673	374.3
Maryland				
Baltimore County	60.2	391	483/9,350	209.4
Massachusetts				
Barnstable County	94.0	1,222	1,356/19,247	1,100
Bristol County	48.9	193	509/6,964	105.8
Dukes County	97.5	167	183/1,587	120.1
Nantucket County	99.5	134	142/1,739	159.7
Plymouth County	87.5	642	741/11,192	400.9
New Jersey				
Gloucester County	27.5	85	130/5,579	52.3
Rhode Island				
Kent County	96.4	373	388/7,842	321.8
Newport County	82.0	421	462/8,847	444.1
Providence County	92.1	873	928/16,541	700.0
Washington County	53.5	441	513/11,896	327.6
Virginia				
Norfolk [a]	56.6	487	561/16,073	311.6

Source: NOAA, Office for Coastal Management, DigitalCoast, ENOW Explorer, 2018.

Notes: N/A = Not Available

[a] Norfolk is a county-equivalent area according to the United States Census Bureau.

3.16.2 Impact Level Definitions for Demographics, Employment, and Economics

This Final EIS uses a four-level classification scheme to analyze potential impact levels on demographics, employment and economics from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.16-11 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for demographics, employment and economics. Table G-15 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to demographics, employment and economics.

Table 3.16-11. Definitions of Potential Adverse and Beneficial Impact Levels for Demographics, Employment, and Economics

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	No measurable impacts would occur.	No measurable impacts would occur.
Minor	Adverse impacts would not disrupt the normal or routine functions of the affected activity or geographic place.	A small and measurable benefit to related to demographics, employment and economics could occur.
Moderate	The affected activity or geographic place would have to adjust somewhat to account for disruptions due to impacts of the Project.	A notable and measurable benefit to related to demographics, employment and economics could occur.
Major	The affected activity or geographic place would experience unavoidable disruptions to a degree beyond what is normally acceptable.	A large local or notable regional benefit to related to demographics, employment and economics could occur.

3.16.3 Impacts of Alternative A – No Action on Demographics, Employment, and Economics

When analyzing the impacts of the No Action Alternative on demographics, employment and economics, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities on the baseline conditions. The cumulative impacts of the No Action Alternative are considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.16.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, the demographics, employment, and economics described in Section 3.16, *Affected Environment,* would continue to follow current regional trends and respond to IPFs introduced by other ongoing non-offshore wind and offshore wind activities.

Activities that would remain important to the region's economy would include tourism, recreation, and marine industries (e.g., fishing). Ongoing non-offshore wind activities within the GAA that would contribute to impacts on demographics, employment, and economics, include ocean-based industries, including tourism and recreation, commercial fishing, marine transportation, ongoing port maintenance and upgrades, maintenance of existing structures (e.g., seawalls, piers), and climate change. There would likely be adverse economic impacts from activities like climate change, that could adversely impact businesses, employment, and wages. Ongoing and planned activities like port maintenance and commercial shipping generate economic activity and would likely benefit the local economy.

Ongoing offshore wind activities within the GAA that contribute to impacts on demographics, employment and economics include:

- Continued O&M of the Block Island project (5 WTGs) installed in state waters;
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of the Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Fork projects would affect demographics, economics and employment through the primary IPFs of energy security/generation, land disturbance, lighting, noise, port utilization, presence of structures, and traffic. Ongoing offshore wind activities would have the same type of impacts from these IPFs that are described in detail in the section below for planned offshore wind activities, but the impacts would be of lower intensity.

3.16.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Future activities without the Proposed Action include residential, commercial, and industrial development of onshore utility projects, land-based wind energy projects, and other offshore wind projects (excluding the Sunrise Wind project). Offshore projects other than offshore wind would support the existing marine industries and workforce. Ocean-based industries, including tourism and recreation, commercial fishing, and marine transportation, would continue to be important to the economies of many of the counties within the Primary Analysis Area.

The demographic, employment, and economics of the Primary Analysis Area would continue to follow current regional trends and respond to IPFs introduced by other current, ongoing or planned offshore wind development projects, and other coastal and ocean-based projects.

Offshore wind could become a new industry for the Atlantic states and The Nation. Several recent reports provide national estimates of employment and economic activity. These studies acknowledge that offshore wind component manufacture and installation capacity exists primarily outside the United States; however, domestic capacity is anticipated to increase. This Final EIS uses available data, analysis,

and projections to make reasoned conclusions on potential economic and employment impacts within the GAA.

Expected job creation from the development of the offshore wind industry in the Northeast was recently described in the report *U.S. Job Creation in Offshore* Wind, which was prepared for NYSERDA and represented a collaboration with members of the Massachusetts Department of Energy Resources, the Massachusetts Clean Energy Center (MassCEC) and the Rhode Island Office of Energy Resources (BVG 2017). This study estimated that during the initial implementation of offshore wind projects along the U.S. northeast coast, a base level of 35 percent of jobs, with a high probability of up to 55 percent of jobs, would be sourced from within the United States. The proportion of jobs filled within the United States would increase as the offshore wind energy industry grows, due to growth of a supply chain and supporting industries along the east coast, as well as a growing number of local operations and maintenance jobs for established wind facilities. By 2030 and continuing through 2056, approximately 65 to 75 percent of jobs associated with offshore wind are projected to be within the United States. Overseas manufacturers of components and specialized ships based overseas that are contracted for installation of foundations and WTGs would fill jobs outside of the United States (BVG 2017). As an example of the mix of local, national, and foreign job creation, for the 5-turbine Block Island Wind Farm, turbine blade manufacturing occurred in Denmark, generator and nacelle manufacturing occurred in France, tower component manufacturing occurred in Spain, and foundation manufacturing occurred in Louisiana (Gould and Cresswell 2017).

The American Wind Energy Association (AWEA) estimates that the wind industry would invest between $80 and $106 billion in U.S. offshore wind development by 2030, of which $28 to $57 billion would be invested within the United States. This figure depends on installation levels and supply chain growth, as other investment would occur in countries manufacturing or assembling wind energy components for U.S. -based projects. While most economic and employment impacts would be concentrated in Atlantic coastal states where offshore wind development would occur—there are over $1.3 billion of announced domestic investments in wind energy manufacturing facilities, ports, and vessel construction—there would be nationwide effects as well (AWEA 2020). The AWEA report analyzes base and high scenarios for offshore wind direct impacts, turbine and supply chain impacts, and induced impacts. The base scenario assumes 20 GW of offshore wind power by 2030 and domestic content increasing to 30 percent in 2025 and 50 percent in 2030, while the high scenario assumes 30 GW of offshore wind power by 2030 and domestic content increasing to 40 percent in 2025 and 60 percent in 2030. Offshore wind energy development would support $14.2 billion in economic output and $7 billion in value added by 2030 under the base scenario. Offshore wind energy development would support $25.4 billion in economic output and $12.5 billion in value added under the high scenario. It is unclear where in the U.S. supply chain growth would occur.

The University of Delaware projects that offshore wind power would generate 30 GW along the Atlantic coast through 2030. This initiative would require capital expenditures of $100 billion over the next 10 years (University of Delaware 2019). Although the industry supply chain is global and foreign sources would be responsible for some expenditures, more U.S. suppliers are expected to enter the industry.

Compared to the $14.2 to $25.4 billion in offshore wind economic output (AWEA 2020), the 2019 annual GDP for states with offshore wind projects (Connecticut, Massachusetts, Rhode Island, New York, New

Jersey, Delaware, Maryland, Virginia, and North Carolina) ranged from $63.5 billion in Rhode Island to $1.73 trillion in New York (BEA 2020) and totaled nearly $5.0 trillion. The $14.2 to $25.4 billion in offshore wind industry output would represent 0.3 to 0.5 percent of the combined GDP of these states.

The AWEA study estimates offshore wind would support 45,500 (base scenario) to 82,500 (high scenario) jobs—full-time equivalent jobs at a given point in time—in the year 2030 nationwide, including direct, supply chain, and induced jobs. Most offshore wind jobs are created during the short-term construction phase. About 60 percent of jobs would be short-term (development and construction) and 40 percent would be long-term (operations and maintenance). A 2020 study commissioned by RODA estimated that offshore wind projects through 2030 would generate 55,989 to 86,138 job-years (a full-time equivalent job lasting 1 year) for construction and 5,003 to 6,994 long-term jobs for operations and maintenance (Georgetown Economic Services 2020). These estimates are generally consistent with the AWEA study in total jobs supported, although the Georgetown Economic Services study concludes that a greater proportion of jobs would be in the construction phase. As with the AWEA estimates of economic output, the RODA study assumed that offshore wind energy jobs would be focused in states hosting offshore wind projects, but would also be generated in other states where manufacturing and other supply chain activities occur. The demand for an increased workforce to is further documented in a National Renewable Energy Laboratory (NREL) report that states that by 2030 the average annual employment levels are estimated at 15,000 and 58,000 based on 25-percent and 100-percent domestic content scenarios, respectively (NREL 2022). This was followed by a second NREL report outlining a road map for actions and outcomes that could address this workforce demand (NREL 2023).

The Primary Analysis Area for this Final EIS is geographically large. In 2018, employment in the seven-state Primary Analysis Area was a combined was 27.8 million (Table 3.16-9). Because projected offshore wind jobs could be located anywhere in the United States, the extent of impacts on the GAA cannot be clearly foreseen; however, a substantial portion of the workforce for planned Massachusetts, Rhode Island, New York, and other northeast and Mid-Atlantic States offshore wind projects would likely be drawn from, or would relocate to, areas within commuting distance of one of the several ports being considered for offshore wind staging, construction and operations.

Some local economic activity has already begun in preparation for the anticipated offshore wind industry. Planned offshore wind activities include offshore wind energy development activities on the Atlantic OCS other than the Proposed Action determined by BOEM to be reasonably foreseeable (see Section E-1 and Attachment 2 in Appendix E for a complete description of planned offshore wind activities). BOEM expects planned offshore wind activities to affect demographics, employment and economics through the following primary IPFs.

Energy security/generation: Once built, offshore wind energy projects could produce energy at long-term fixed costs. These projects could provide reliable prices once built compared to the volatility of fossil fuel prices. Appendix E outlines the estimated electricity planned for offshore wind activities along the east coast. The economic impacts of future offshore wind activities (including associated energy storage and capacity projects) on energy generation and energy security cannot be quantified but could be long term and beneficial.

Cable emplacement and maintenance: Offshore cable emplacement for future offshore wind projects would temporarily impact commercial fishing and for-hire recreational fishing businesses, static gear fishing vessels, and recreational vessels based in the GAA during cable installation and maintenance. Cable emplacement supporting offshore wind activities would occur offshore from the GAA for demographics, employment, and economics, resulting in seafloor disturbance, and fishing vessels may not have access to impacted areas during active construction. The disruption from cable installation may occur concurrently or sequentially, with similar impacts on commercial fishery resources. Disruption may result in conflict over other fishing grounds, increased operating costs for vessels, and lower revenue (e.g., if the substituted fishing area is less productive or supports less valuable species). Short-term productivity reductions would also affect seafood processing and wholesaling businesses that depend upon the fishing industry.

Assuming other projects use installation procedures similar to those proposed in the Sunrise Wind COP Section 3.3 (Sunrise Wind 2023a), the duration and extent of impacts would be limited. Commercial fishing and for-hire recreational fishing and the related processing industries represent a small portion of the employment and economic activity in the GAA. The economic impact of cable emplacement and maintenance on commercial fishing and for-hire recreational fishing businesses is covered in more detail in Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*, and would be localized and short-term.

Land disturbance: Offshore wind development would require onshore cable installation, substation construction or expansion, and possibly expansion of shore-based port facilities. Depending on siting, land disturbance could result in localized, short-term disturbances of businesses near cable routes and construction sites for substations and other electrical infrastructure, and could consist of increased noise, traffic, and road disturbances. The activities would be similar in character and duration to other common construction projects, such as utility installations, road repairs, and industrial site construction. Impacts on employment would be localized, short-term, and both beneficial (jobs and revenues to local businesses that participate in onshore construction) and adverse (potentially lost revenue due to construction disturbances).

Lighting: Aviation obstruction warning lights are required for offshore WTGs and would be visible from some beaches and coastlines and could have effects on economic activity in certain locations if the lighting influences visitors in selecting coastal locations to visit, or potential residents in selecting residences. At night, required aviation obstruction lighting on the WTGs would consist of two L-864 medium-intensity red lights mounted on the nacelle flashing 30 times per minute, as well as up to three L-810 low-intensity red lights mounted on the midsection of the WTG. Depending on the location of the other offshore wind projects, some may be more visible than others from land viewpoints. However, a University of Delaware study evaluating the impacts of visible offshore WTGs on beach use found that WTGs visible more than 15 mi (24.1 km) from the viewer would have negligible impacts on businesses dependent on recreation and tourism activity (Parsons and Firestone 2018). The vast majority of the WTG positions envisioned offshore of the GAA would be more than 15 mi (24.1 km) from coastal locations with views of the WTGs. These lights would be incrementally added over the construction period and would be visible for the operating lives of future offshore wind activities. Distance from shore, topography, and atmospheric conditions would affect light visibility.

ADLS is an emerging technology that, if implemented at offshore wind projects, would only activate aviation warning lighting on WTGs when aircraft enter a predefined airspace. If implemented, ADLS would reduce the amount of time that WTG lighting is visible. Visibility would depend on distance from shore, topography, and atmospheric conditions. Such systems would likely reduce impacts on demographics, employment, and economics associated with lighting.

Nighttime construction and maintenance of offshore wind projects would require lighting for vessels in transit and at offshore construction work areas. Vessel lighting would enable commercial shipping and commercial fishing operations to safely navigate around the vessels and work areas and would be visible from coastal locations, primarily while the vessels are in transit. Vessel lighting is not anticipated to impact the volume of business at visitor-oriented businesses or other businesses. Impacts of vessel lighting would be localized, short-term, intermittent, and possibly adverse.

Noise: Noise from site assessment G&G survey activities, O&M, pile driving, trenching, and vessels could result in short-term impacts on employment and economics via the impacts on marine businesses (e.g., commercial fishing and for-hire recreational fishing, and recreational sightseeing).

Noise (especially site assessment G&G surveys and pile driving) would affect fish populations, with effects on commercial fishing and for-hire recreational fishing. As discussed in Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing,* increased noise could temporarily affect the availability of fish within work areas, causing fishing vessels to relocate to other fishing locations in order to continue to earn revenue. This could potentially lead to increased conflict in relocation areas, increased operating costs for vessels, and lower revenue. The severity of such impacts would depend on the overlap of construction activities, where construction activities occur in relation to preferred fishing locations, and how exactly the commercial fishing industry responds to future construction activities.

Overall, offshore wind-generated noise could result in visitor-oriented services avoiding areas of noise and impacts on marine life important for fishing and marine sightseeing businesses (i.e., marine mammal tours offshore, etc.). Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*, provides details on potential economic impacts on commercial fishing and for-hire recreational fishing businesses. Section 3.21, *Recreation and Tourism*, provides details on potential impacts to recreation and tourism. Both types of impacts would be localized and short-term, occurring during surveying and construction, with only periodic, short-term impacts during the O&M phase of the project. Noise impacts during surveying and construction would be more widespread when multiple offshore wind projects are under construction at the same time in the marine area off the coast of the GAA.

Onshore construction noise could possibly result in a short-term reduction of economic activity for businesses near installation sites for onshore cables or substations, temporarily inconveniencing workers, residents, and visitors. Because the location of onshore improvements is not known and cannot be determined until specific projects are proposed, the magnitude of noise associated with onshore construction and the number of businesses and homes affected cannot be determined. Impacts on demographics, employment, and economics from noise would be, intermittent and short-term, similar to other onshore utility construction activity.

Port utilization: Offshore wind installation would require port facilities for berthing, staging, O&M and loadout. Development activities would bolster port investment and employment while also supporting

jobs and businesses in supporting industries. Future offshore wind development would also support planned expansions and modifications at ports in the GAA. While simultaneous construction or decommissioning (and, to a lesser degree, O&M) activities for multiple offshore wind projects in the GAA could stress port capacity, it would also generate considerable economic activity and benefit the regional economy and infrastructure investment.

Port utilization would require a trained workforce for the offshore wind industry including additional shore-based and marine workers that would contribute to local and regional economic activity. Improvements to existing ports and channels would be beneficial to other port activity, including commercial fishing and for-hire recreational fishing, and other marine businesses. Port utilization in the GAA would occur primarily during development and construction projects, anticipated to occur primarily between 2023 and 2030. Ongoing O&M activities would sustain port activity and employment at a lower level after construction.

Offshore wind activities and associated port investment and usage would have long-term, beneficial impacts on employment and economic activity by providing employment and industries such as marine construction, ship construction and servicing, and related manufacturing. The greatest benefits would occur during offshore wind project construction between 2023 and 2030. If offshore wind construction results in competition for scarce berthing space and port service, port usage could potentially have short- to medium-term adverse impacts on commercial shipping.

Presence of structures: Appendix E outlines the offshore wind activities expected in the U.S. Atlantic coast under the No Action Alternative and outlines the number of offshore wind structures (WTGs) expected. The offshore export cables and hard protection associated with these offshore wind farm developments would increase the risk of gear loss connected with cable mattresses and structures along the east coast. Fisheries using bottom gear may be permanently disrupted, which would increase economic impacts on the commercial fishing and for-hire recreational fishing industries. These offshore facilities would also pose allision and height hazard risks, creating obstructions and navigational complexity for marine vehicles, which would impose fuel costs, time, and risk and require adequate technological aids and trained personnel for safe navigation. In the event of an allision, vessel damage and spills could result in both direct and indirect costs for commercial/for-hire recreational fishing.

The potential for additional offshore wind energy structures within the GAA could encourage fish aggregation and generate reef effects that attract recreational fishing vessels. Fish aggregation could increase human fishing activities, but this attraction would likely be limited to the minority of recreational fishing vessels that already travel as far from the shore as the wind energy facilities. Fish aggregation could potentially result in broad changes in recreational fishing practices if these effects are widespread enough to encourage more participants to travel farther from shore.

The increase in hard coverage for future offshore wind foundations could create foraging opportunities for harbor and gray seals, sea turtles, bats, northern gannets, loons, and peregrine falcons, possibly attracting private or commercial recreational sightseeing vessels. As a result, the presence of new habitat could increase economic activity associated with offshore sightseeing. New structures would be added intermittently between 2023 and 2030 and could benefit structure-oriented species as long as the structures remain.

As a result of fish aggregation and reef effects associated with the presence of offshore wind structures, there would be long-term impacts on commercial fishing operations and support businesses such as seafood processing. The fishing industry is expected to be able to adapt its fishing practices over time in response to these changes. These effects could simultaneously provide new business opportunities such as fishing and tourism. Overall, the presence of offshore wind structures would have continuous, long-term impacts on demographics, employment, and economics.

The offshore structures would also necessitate alterations in the routes of for-hire recreational fishing, recreational tour boat businesses, sailing races, and highly migratory species (HMS) angling. Some offshore wind structures would provide new business opportunities due to fish aggregation and reef effects—which could attract fish valued for recreational fishing—and the possibility of tours for visitors interested in a close-up view of the wind structures, as has occurred for the Block Island Wind Farm.

The views of offshore WTGs could have impacts on certain businesses serving the recreation and tourism industry. Impacts could be adverse for particular locations if visitors and customers avoid certain businesses (i.e., hotels or rental dwellings) due to views of the WTGs; impacts could be neutral or beneficial if views do not affect visitor decisions or influence some visitors beneficially. Section 3.22, *Scenic and Visual Resources*, discusses visibility of WTGs from beaches and coastal areas in the GAA for demographics, employment, and economics.

A joint research study of the University of Connecticut and Lawrence Berkeley National Laboratory titled *Relationship between Wind Turbines and Residential Property Values in Massachusetts,* found no net effects from WTGs on property values in Massachusetts (Atkinson-Palombo and Hoen 2014). The study examined impacts of 41 onshore WTGs located 0.25 to 1 mile (0.4 to 1.6 kilometers) from residences. The study noted weak evidence linking the announcement of new WTGs to adverse impact on home prices and found that those effects were no longer apparent after the start of WTG operations. The offshore wind structures would be different from the report data in that offshore WTGs would be much larger than the onshore WTGs but located much further from residences and appear small on the horizon. Additionally, a 2017 study found that when placed more than 8 mi (7 nm; 13 km) from shore, there is a minimal effect on vacation rental values associated with offshore wind farms (Lutzeyer et al. 2017). A 2018 study also found that there was no impact on property values when the wind farm is located 5.6 mi (9 km) offshore (Jensen et al. 2018). Therefore, it is unlikely that the development of offshore wind farms and the presence of structures would have an impact on property values of homes onshore.

Overall, the presence of offshore wind structures would have a continuous, long-term impact on employment and economics in commercial fishing and for-hire recreational fishing, marine recreation and coastal recreation and tourism.

Traffic: Offshore wind construction and decommissioning and, to a lesser extent, offshore wind operations would generate increased vessel traffic. This additional traffic would support increased employment and economic activity for marine transportation and supporting businesses, investment in the ports which are being considered as staging points for this Project and investment in other ports outside of the GAA. Increased vessel traffic would have continuous, beneficial impacts during all project phases, with stronger impacts during construction and decommissioning.

Impacts of short-term increased vessel traffic during construction could include increased vessel traffic congestion, delays at ports, and a risk for collisions between vessels. As stated in Section 3.16, future offshore wind projects would result in a small incremental increase in vessel traffic, with a short-term peak during construction. Increased vessel traffic would be localized near affected ports and offshore construction areas. Congestion and delays could increase fuel costs (i.e., for vessels forced to wait for port traffic to pass), and could decrease productivity for commercial shipping, fishing, and recreational vessel businesses, whose income depends on the ability to spend time out of port. Collisions could lead to vessel damage and spills, which could have direct costs (i.e., vessel repairs and spill cleanup) as well as indirect costs from damage caused by spills.

The magnitude of increased vessel traffic is described in more detail in Section 3.19, *Navigation and Vessel Traffic*, and would depend upon the vessel traffic volumes generated by each offshore wind project, the extent of concurrent or sequential construction of wind energy projects, and the ports selected for each project. Increased vessel traffic congestion and collision risk would have continuous, short-term impacts during all project phases, with stronger impacts during construction and decommissioning.

Climate change: Climate change could affect demographics, employment, and economics in the GAA. Sea level rise and increased storm frequency and severity could result in property or infrastructure damage, increase insurance cost, and reduce the economic viability of coastal communities. Impacts on marine life due to ocean acidification, altered habitats and migration patterns, and disease frequency would affect industries that rely on these species. It is anticipated that there would be a net reduction in GHG emissions that contribute to climate change, and no collective adverse impact on climate change as a result of offshore wind projects.

3.16.3.3 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, the GAA would continue to be influenced by regional demographic and economic trends. Ongoing activities, future non-offshore wind activities, and future offshore wind activities would continue to sustain and support economic activity and growth within the GAA based on anticipated population growth and ongoing development of businesses and industry. Tourism and recreation would continue to be important to the economies of the coastal areas. Marine industries such as commercial fishing and shipping would continue to be active and important components of the regional economy. Counties in the GAA would continue to seek to diversify their economies—including maintaining or increasing their year-round population and protect environmental resources.

BOEM anticipates that ongoing activities in the GAA (continued commercial shipping and commercial fishing; ongoing port maintenance and upgrades; periodic channel dredging; maintenance of piers, pilings, seawalls, and buoys; and the use of small-scale, onshore renewable energy) would have **minor** adverse and **minor beneficial** impacts on demographics, employment, and economics.

Planned activities for coastal and marine activity, other than offshore wind, include development of diversified, small-scale, onshore renewable energy sources; ongoing onshore development at or near current rates; continued increases in the size of commercial vessels; potential port expansion and

channel-deepening activities; and efforts to protect against potential increased storm damage and sea level rise. BOEM anticipates that there would be **minor** adverse and **minor beneficial** impacts on demographic, employment, and economics from these planned activities. BOEM expects the combination of ongoing and planned non-offshore wind activities to result in minor adverse impacts and minor beneficial impacts on ocean-based employment and economics, driven primarily by the continued operation of existing marine industries, especially commercial fishing, recreation/tourism, and shipping; increased pressure for environmental protection of coastal resources; the need for port maintenance and upgrades; and the risks of storm damage and sea level rise. Increased investment in land and marine ports, shipping, and logistics capability is an expected result of the project, along with component laydown and assembly facilities, job training, and other services and infrastructure necessary for offshore wind construction and operations. Additional manufacturing and servicing businesses would result either in the GAA or other locations in the United States if supply chains develop as expected. While it is not possible to estimate the extent of job growth and economic output within the GAA specifically, there would be notable and measurable benefits to employment, economic output, infrastructure improvements, and community services, especially job training, because of offshore wind development.

Many jobs generated by offshore wind are short-term construction jobs. However, the combination of construction needs across multiple offshore wind projects creates notable employment opportunities. Other beneficial impacts include long-term O&M jobs; long-term tax revenues; long-term economic benefits of improved ports and other industrial land areas; diversification of marine industries, especially in areas currently dominated by recreation and tourism; and growth in a skilled marine construction workforce. Therefore, BOEM anticipates that there would be overall **minor beneficial** impacts from future offshore wind activities in the GAA, combined with ongoing activities and planned activities other than offshore wind.

Cumulative Impacts of the No Action Alternative

BOEM anticipates that the No Action Alternative, when combined with all planned activities (including other offshore wind activities), would result in **minor** adverse and **moderate beneficial** cumulative impacts due primarily to the impacts on commercial fishing and for-hire recreational fishing businesses and marine recreational businesses (tour boats, marine suppliers) primarily through cable emplacement, noise and vessel traffic during construction, and the presence of offshore structures during operations. These IPFs would temporarily disturb marine species and displace commercial or for-hire fishing vessels, which could cause conflicts over other fishing grounds, increased operating costs, and lower revenue for marine industries and supporting businesses. The long-term presence of offshore wind structures would also lead to increased navigational constraints and risks and potential gear entanglement and loss. Beneficial impacts would result from increase employment and economic activity associated with multiple offshore wind projects being developed and operated in the region.

3.16.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in Appendix C would result in impacts similar to or less than those described in the

sections below. The following proposed PDE and potential variances (Appendix C) that would influence the magnitude of the impacts to demographics, employment and economics:

- The number, size, and location of WTGs;
- During the construction phase, the amount of helicopter support required;
- Related to onshore export cable route and construction (Holbrook Construction Areas and Volumes), the length of onshore cable route, cable trenches, corridor width, and corridor area;
- Related to the onshore substation (Holbrook), the permanent site area and short-term construction workspace;
- Related to the overhead Transmission Line (Holbrook), the maximum length of onshore interconnection cable route, landfall type, the HDD noise levels, and number of personnel.

The size of the proposed Project would affect the overall investment and economic impacts associated with the proposed Project and alternatives outlined below. An adjustment in the number or type of WTGs installed would be changes in the amount of materials purchased, number of vessels required, and amount of labor and equipment required. Beneficial economic impacts within the GAA would depend on the number of workers, materials, vessels, equipment, and services required for the WTGs purchased and layout, and the overall proportion that can be locally sourced and the specific ports used by the proposed Project.

3.16.5 Impacts of Alternative B – Proposed Action on Demographics, Employment, and Economics

The Proposed Action's beneficial impacts on demographics, employment and economics depend on the proportion of workers, materials, vessels, equipment, and services that can be locally sourced. A study conducted by BW Research Partnership on behalf of E2, a national, nonpartisan group of advocates for policies that benefit both the economy and environment, evaluated the potential spending impacts across five states on the east coast, including New York, New Jersey, and Virginia, which are in the Primary Analysis Area for this proposed Project. The study indicated that for every $1.00 spent building an offshore wind farm is estimated to generate $1.72, $1.83, and $1.73 for New York, New Jersey, and Virginia's state economies (E2 2018). It is presumed that the other states within the Primary Analysis Area would fall in a similar range but is dependent on the amount of locally sourced labor and project components noted above.

Sunrise Wind's economic impact study includes an assessment of job creation based on the widely recognized Jobs and Economic Development Impact (JEDI) Offshore Wind Model, developed by the NREL, and most recently updated in 2021. That analysis found that the construction of the Project would support an estimated 1,843 direct U.S. job-years (full-time equivalent jobs multiplied by the number of construction years) during the construction phase and approximately 189 additional annual direct U.S. jobs during the operations phase (COP, December 1, 2020, Appendix W – *Economic Modeling Report*, AKRF 2020).

Direct employment refers to jobs created by the direct hiring of workers. Indirect employment refers to jobs created through increased demand for materials, equipment, and services. Induced employment

refers to jobs created at businesses where offshore wind industry workers would spend their incomes. This direct U.S. job creation as a result of the Sunrise Wind project, noted above, would also result in indirect and induced job creation. Overall, including consideration of both direct (onsite) jobs and those generated indirectly from supply chain and support services, as well as induced jobs supported by worker spending, construction of the Project would support an estimated 16,193 U.S. job-years (full-time equivalent jobs multiplied by the number of construction years) during the construction phase and approximately 635 additional annual U.S. jobs during the operations phase. The geographic location of these jobs would be dependent on the phase of the proposed Project, the ports chosen to support the staging, construction, O&M and decommissioning of the proposed Project, among other variables.

The Proposed Action would support a range of positions for professionals such as engineers, environmental scientists, financial analysts, administrative personnel; trade workers such as electricians, technicians, steel workers, welders, and ship workers; and other construction jobs during construction and installation of the Proposed Action. O&M would create jobs for maintenance crews, substation and turbine technicians, and other support roles. The decommissioning phase would also generate professional and trade jobs and support roles. Therefore, all phases of the Proposed Action would lead to local employment and economic activity.

Assuming that conditions are similar to those of the Vineyard Wind project, job compensation (including benefits) is estimated to average between $88,000 and $96,000 for the construction phase, with occupations including engineers, construction managers, trade workers, and construction technicians. O&M occupations would consist of turbine technicians, plant managers, water transportation workers, and engineers, with average annual compensation of approximately $99,000 (BOEM 2021). A study from the New York Workforce Development Institute provided estimates of salaries for jobs in the wind energy industry that concur with Vineyard Wind's projections. The expected salary range for trade workers and technicians ranges from $43,000 to $96,000, $65,000 to $73,000 for ships' crew and officers, and $64,000 to $150,000 for managers and engineers (Gould and Cresswell 2017).

The hiring of local workers would stimulate economic activity through increased demand on housing, food, transportation, entertainment, and other goods and services. Seasonal housing units are available in the vicinity of the proposed Project; however, many of these may be second homes and vacation rentals that may not be reliable as rentals. In addition, during the summer, competition for short-term accommodations may arise, leading to higher rents. However, this effect would be short-term during the active construction period and could be reduced if construction is scheduled outside the busy summer season. Permanent workers are expected to reside locally; there is adequate housing supply to accommodate the increase in the local workforce (Table 3.16-5). As indicated previously, where feasible workers would be hired from the local workforce to meet labor needs of the proposed Project's construction, O&M, and decommissioning.

Tax revenues for state and local governments would increase as a result of Project expenditures. Equipment, fuel, and some construction materials would likely be purchased from local or regional vendors. These purchases would result in short-term impacts on local businesses by generating additional revenues and contributing to the tax base. Once the Project is operational, property taxes would be assessed on the value of the Sunrise Wind facilities. The increased tax base during operations would be a long-term, beneficial impact on local governments in the proposed Project Area.

In addition, Sunrise Wind has committed to invest more than $400 million in New York in accordance with the OREC agreement for the proposed Project and this agreement includes several commitments. In March 2023, the Town of Brookhaven entered into a host community agreement with Sunrise Wind that outlined a variety of developments, investments and benefits to the community. It could result in more than $700 million of investment for assets, jobs and programming in Suffolk County (Sunrise Wind 2023b). Sunrise Wind is committed to working with minority and women-owned businesses so that the developing offshore wind supply chain is inclusive and diverse. Sunrise Wind is also providing $10 million in seed funding to create a National Offshore Wind Training Center in Brentwood, within Suffolk County. Together with partners from labor, academia, and the environmental community, the National Offshore Wind Training Center would feature specialized facilities and programming that is essential to offshore work, aiming to cement Suffolk County's role as an integral part of the emerging offshore wind industry. Suffolk County Community College would serve as the academic arm of this initiative. A state-of-the-art Operations and Maintenance Hub would be created in East Setauket that would create up to 100 new, long-term jobs, and Sunrise Wind designated Port Jefferson as the home port of the project's custom-built 260 ft Service Operation Vessel, as well as funding $5 million for a Research and Development Partnership with Stony Brook University (Sunrise Wind 2023b). Finally, Sunrise Wind has also committed to performing secondary steel fabrication in the New York Capital Region and funding the Upper Hudson Valley Work Force Initiative. These initiatives would ensure residents throughout New York have access to this opportunity and the training needed to succeed in the offshore wind industry.

In addition, as stated in their Draft EIS comment letter dated February 14, 2023, Sunrise Wind also indicated they were entering negotiations with New York contractors and trade labor organizations on a Project Labor Agreement to cover construction activities for the proposed Project and committing to paying prevailing wages.

The reasonably foreseeable environmental trends and impacts of the Proposed Action are described by IPFs below.

3.16.5.1 Construction and Installation

3.16.5.1.1 Onshore Activities and Facilities

Cable emplacement and maintenance: Onshore cable related construction includes installation of the onshore transmission cable and onshore interconnection cable. Construction would primarily occur within existing public road and utility ROWs and the construction activities would be similar to other construction projects, where there may be additional noise and/or traffic impacts in certain areas, which could disrupt business activities in those areas. These disruptions would be short-term, adverse impacts, but mitigated through implementation of mitigation and EPMs. APMs to minimize impacts from cable emplacement and maintenance include conducting construction of the Landfall and ICW HDD outside of the summer tourist season, which is generally between Memorial Day and Labor Day, the construction of the remaining onshore facilities (such as the cables) would be designed to minimize impacts to the local communities to the extent feasible, and where feasible, local workers would be hired to meet labor needs for the Proposed Action. In addition, the onshore transmission cable and onshore interconnection

cable would not include any overhead utility poles, thus minimizing potential impacts to adjacent properties.

Cable emplacement and maintenance for onshore activities and facilities would create short-term, jobs during the construction period, which would be a beneficial impact, and where feasible, local workers would be hired to meet labor needs for proposed Project construction.

Land disturbance: Construction of the Proposed Action would require construction of the OnCS-DC, onshore transmission cable and onshore interconnection cable. Installation of the cables would occur within a short-term construction corridor, which are mostly within existing roadways and ROW. Landfall would occur at Smith Point County Park, and the cables would then traverse north and west to terminate at the OnCS-DC and ultimately connect to the Holbrook Substation (Figure 2.1-3). The employment and economic impact of the Proposed Action caused by disturbance of businesses near the onshore cable route and substation construction site would result in localized, short-term, minor impacts. The Proposed Action's impact to land disturbance impacts on demographics, employment, and economics from ongoing and planned activities would be short-term and minor due to the short-term and localized disruption of onshore businesses.

Lighting: Lighting in this context primarily refers to aviation safety lighting for the offshore WTGs, and there is not anticipated to be additional lighting for onshore activities and facilities outside of perhaps some lights during the construction period, as needed. The impact of any onshore lighting related to the Proposed Action would be short-term and negligible.

Noise: Noise onshore may be present from the construction and installation of the OnCS-DC, onshore transmission cable and onshore interconnection cable, including construction-related vehicle noise (i.e., dump trucks, backhoes, concrete saws, air compressors and portable generators), noise from areas requiring HDD, site preparation, and general vehicular traffic. The noise generated during construction and installation of onshore facilities would be short-term and may have a minor impact on adjacent land uses; however, mitigation measures would be implemented, and the proposed Project would be designed to minimize impacts to the local communities to the extent feasible, including Sunrise Wind committing to screening at the OnCS-DC to the extent feasible, to reduce potential visibility and noise.

Presence of structures: Presence of structures in this context primarily refers to the WTGs and other support facilities offshore; therefore, there would be no impact related to onshore activities and facilities. Most of the onshore facilities would be buried (i.e., the cables), but the OnCS-DC would be above-ground construction; however, the OnCS-DC would be located in a heavily industrial area and impacts would be long-term and negligible.

Traffic: Traffic in this context refers to land-based vehicular traffic related to the construction of onshore facilities, including the OnCS-DC, onshore transmission cable and onshore interconnection cable. Sunrise Wind has proposed an APM of coordinating with local authorities to develop a Maintenance and Protection of Traffic (MPT) Plan as part of the Project's EM&CP to minimize potential traffic impacts during construction to help minimize impact from construction. However, construction activities may require some detours and/or additional congestion during the period of construction of the onshore facilities along the roadways where the cable would be installed but be similar to a routine construction

project. This could result in temporary disruption to business activities in adjacent land uses; however, these impacts would be short-term and minor.

3.16.5.1.2 Offshore Activities and Facilities

Cable emplacement and maintenance: The Proposed Action's cable emplacement would generate vessel anchoring and dredging at the worksite, requiring other vessels to avoid and navigate around the worksites and resulting in short-term disturbance to species important to commercial and recreational fishing, other forms of recreation and tourism, with potential adverse effects on employment and income. The SRWEC includes a corridor length of up to 104.7 mi (168.5 km) where cable emplacement would be conducted, as well as IAC amongst the WTGs within the SRWF.

The maximum seafloor disturbance associated with construction and operation of the SRWEC and IAC is summarized in Appendix C. This seafloor disturbance would result in a disruption of fish stocks, and concrete mattresses covering cables in hard-bottom areas could hinder commercial trawlers/dredgers, potentially reducing income and increasing costs for affected businesses over the long term. Cable installation would have localized, short-term, minor impacts on demographics, employment, and economics, while maintenance of the Proposed Action and other existing submarine cables would have intermittent, long-term, negligible impacts.

Lighting: Lighting in this context refers primarily to the aviation hazard lighting on the WTGs but could also include effects from nighttime lighting associated with vessels and other construction and installation related equipment. The impacts would be primarily to the recreational and commercial fishing, pleasure, and tour boating community. Impacts would be short-term and negligible, and the impacts to potential fishing, recreating or other marine-related businesses would be minor.

Noise: Noise from the offshore facilities component of the Proposed Action construction (primarily pile driving) could temporarily affect fish and marine mammal populations, hindering fishing and sightseeing near construction activity within the SRWF, which could discourage some businesses from operating in these areas during pile driving (see Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*). This would result in a localized, short-term, minor impact on these marine-related businesses and therefore demographics, employment, and economics, but would return to normal conditions following the completion of construction activities.

In addition, trenching and/or HDD for cable emplacement activities emit noise. This noise could temporarily disrupt commercial fishing, marine recreational businesses, and onshore recreational businesses. Noise from trenching and trenchless technology would affect marine life populations, which would in turn affect commercial and recreational fishing businesses. Impacts on marine life would also affect onshore recreational businesses due to noise near public beaches, parks, residences, and offices. The use of trenchless technology at natural and sensitive landfall locations where possible would minimize direct impacts, as well as the intent to perform construction at the landfall outside the summer tourist season, which is generally between Memorial Day and Labor Day. Cable laying, trenching, and HDD would have localized, intermittent, short-term, and negligible impacts on demographics, employment, and economics.

Vessel noise could affect marine species relied upon by commercial fishing businesses, marine recreational businesses, recreational boaters, and marine sightseeing activities. Vessel traffic would occur between ports (outside the recreational and tourism GAA) and offshore wind work areas. Most vessel traffic would travel to the WTG installation area, with fewer vessels needed along the cable installation routes. Noise from vessels would have short-term, intermittent, negligible impacts on demographics, employment, and economics.

Noise generated by the Proposed Action's staging operations at ports would produce some noise; however, these are existing ports in industrial areas. Several ports are being considered to support construction and installation of offshore facilities. Depending upon the specific ports selected to support construction, noise from the Proposed Action, in combination with ongoing and planned activities, would have a variable, short-term, negligible to minor impact on demographics, employment, and economics.

Port utilization: The Proposed Action would require port facilities for berthing, staging, and loadout to support the construction and installation of offshore facilities. The activities at ports would support port investment and employment and would also support jobs and businesses in supporting industries and commerce. There are 10 ports identified for consideration that could support construction and installation activities for offshore facilities (Table 3.16-2). These ports would require a trained workforce for the offshore wind industry including additional shore-based and marine workers that would contribute to local and regional economic activity.

The economic benefits would be greatest during construction when the most jobs and most economic activity at ports supporting the Proposed Action would occur. These jobs related to construction and installation of offshore facilities would be short-term and are outlined at the beginning of this section (see Section 3.16.5). As a result of this activity, and offshore wind development in general, investments are being made at many of these ports, which would benefit other port users, including maintenance and dredging of shipping channels. The Proposed Action would have a minor to moderate beneficial impact on demographics, employment, and economics from port utilization due to greater economic activity and increased employment at ports used by the Proposed Action.

Traffic: In this context, traffic is referring to vessel traffic generated during construction of the offshore facilities as part of the Proposed Action. The Proposed Action would generate vessel traffic in the proposed Project Area and to and from the ports supporting project construction of offshore facilities. Increased vessel traffic would increase the use of port and marine businesses, including tug services, dockage, fueling, inspection/repairs, and provisioning. The vessel traffic generated by the Proposed Action alone would result in increased business for marine transportation and supporting services in the GAA with continuous, short-term, and minor beneficial impacts during construction.

Vessel traffic associated with the Proposed Action could also result in short-term, periodic congestion within and near ports, leading to potential delays and an increased risk for collisions between vessels, which would result in economic costs for vessel owners. As a result of potential delays from increased congestion and increased risk of damage from collisions and/or allisions, the Proposed Action would have continuous, short-term, and minor impacts during construction.

3.16.5.2 Operations and Maintenance

3.16.5.2.1 Onshore Activities and Facilities

Land disturbance: During the O&M phase of the project, the onshore transmission cable infrastructure, including cable landfall sites and onshore cables, would be underground and primarily within roads and utility ROW, while the substation would operate within an industrial area. As a result, operations and occasional maintenance or repair operations from the Proposed Action alone would have negligible and long-term impacts.

Lighting: Lighting in this context primarily refers to aviation safety lighting for the offshore WTGs. There is not anticipated to be lighting for onshore activities and facilities during the O&M phase of the project, beyond perhaps some lights during a specific repair or maintenance activity, as needed during non-daylight hours. The impact of any onshore lighting related to O&M and the Proposed Action on demographics, employment and economics would be negligible.

Noise: Noise onshore may be present from O&M activities related to the OnCS-DC, onshore transmission cable and onshore interconnection cable. This would include operation of the OnCS-DC, which would be a new noise source and limited noise from routine maintenance that may require short-term use of equipment to facilitate inspections and repairs. Sunrise Wind proposes to implement screening at the OnCS-DC, an APM that is intended to reduce potential noise and visibility.

The OnCS-DC is located in an already industrial area and noise generated from O&M activities would be minimal, ongoing, and long-term for operation of the OnCS-DC and therefore would have a negligible impact on demographics, employment, and economics.

Traffic: Traffic in this context primarily refers to land-based vehicular traffic during the O&M phase for onshore facilities. Once the onshore facilities are constructed, there would be minimal long-term traffic impacts. There could be routine or as-needed maintenance along the cable routes or at the OnCS-DC; however, this would be negligible in the context of the surrounding area.

3.16.5.2.2 Offshore Activities and Facilities

Energy security/generation: The Proposed Action would install 94, 11-MW WTGs within 102 positions that would expect to produce up to 1,034 MW of electricity, or 3 percent of the estimated 35 GW of reasonably foreseeable offshore wind generation potential for the U.S. east coast. Offshore wind energy projects could produce energy at long-term fixed costs, which could provide stability against fossil fuel price volatility once built. Therefore, the Proposed Action would provide long-term contributions to energy security and resilience through a stable supply of energy. In context of reasonably foreseeable environmental trends, future offshore wind activities would have similar contributions to energy generation and security as the Proposed Action but on a larger scale. Impacts related to energy generation and security would have long-term, regional, and minor beneficial impacts on demographics, employment, and economics.

Cable emplacement and maintenance: O&M activities related to the offshore cable emplacement for the Proposed Action would temporarily affect commercial fishing and for-hire recreational fishing

businesses, marine recreation, and subsistence fishing during infrequent maintenance; however, would be less than during construction and installation and considered negligible.

Lighting: As described in Section 3.22, *Scenic and Visual Resources*, nighttime aviation safety lighting on all of the Proposed Action's WTGs could be visible from coastal and elevated locations (depending on vegetation, topography, weather, and atmospheric conditions). Sunrise Wind has committed to voluntarily implement ADLS or related means (e.g., dimming or shielding) to limit visual impact as an APM to limit visual impacts. ADLS would activate the Proposed Action's WTG lighting only when aircraft approach the Sunrise Wind Project WTGs, as compared to standard continuous FAA hazard lighting.

Aviation hazard lighting from 94 WTGs associated with the Proposed Action could potentially be visible from coastal locations. Related impacts could include recreational and commercial fishing, pleasure, and tour boating community would experience major adverse effects in foreground views, while onshore viewers would experience minor to moderate effects from nighttime lighting associated with O&M activities. ADLS reduces nighttime impact significance from major to moderate and moderate to minor, due to substantially limited hours of lighting.

In addition, as noted in Section 3.16, studies have shown that there is little evidence to indicate the construction and operation of WTGs in offshore areas at the distance the SRWF would be located would have an impact on property values. Therefore, it is unlikely that the development of offshore wind farms and the presence of structures, and associated lighting, would have an impact on property values of homes onshore, so impacts on demographics, employment, and economics would be negligible.

Noise: Noise impacts related to the Proposed Action's O&M activities for offshore facilities would take two forms. In the offshore environment, noise from vessel traffic would affect commercial fishing businesses and recreational businesses due to impacts on species important to commercial fishing and for-hire fishing, recreational fishing, and marine sightseeing activities and noise from maintenance and repair operations that make the wind energy facilities less attractive to fishing operators and recreational boaters. Noise from O&M activities would have localized, intermittent, long-term, negligible impacts on demographics, employment, and economics.

The Proposed Action would also consider the use of five ports for support during offshore O&M activities. These ports have other industrial and commercial sites, as well as major roads, which generate ongoing noise. Therefore, noise from vessels or O&M mobilizing activities from the Proposed Action alone would have variable, negligible impacts on demographics, employment and economics.

Port utilization: The Proposed Action would require port facilities to support O&M activities related to offshore facilities. Five ports are being considered for supporting offshore O&M activities (see Table 3.16-2). These ports would require a trained workforce for the offshore wind industry including additional shore-based and marine workers that would contribute to local and regional economic activity. Long-term job creation related to offshore O&M activities are noted at the beginning of this section (see Section 3.16.5), and to the extent feasible would be hired from the local labor force.

The Proposed Action would have a long-term, minor beneficial impact due to greater economic activity and increased employment at the ports in the GAA, although to a lesser extent during the O&M phase than during construction. The Proposed Action would also have minor beneficial impacts on through

long-term increased job availability and investment in port facilities supporting other marine-related businesses.

Presence of structures: The Proposed Action would add up to 95 offshore wind structures (94 WTGs and 1 OCS-DC) along with an offshore export cable. The presence of structures could have both adverse and beneficial effects as outlined below.

The presence of these structures could affect marine-based businesses (i.e., commercial fishing and for-hire recreational fishing businesses, offshore recreational businesses, and related businesses) through impacts such as entanglement and gear loss/damage, navigational hazard and risk of allisions, fish aggregation, habitat alteration, and space-use conflicts. These structures may cause vessel operators to reroute, which would affect their fuel costs, operating time, and revenue. Due to the risk of gear entanglement, fisheries using bottom gear may be permanently disrupted, which would increase economic impacts on the commercial fishing and for-hire recreational fishing industries. This would have continuous, long-term, and minor impacts on demographics, employment, and economics.

Offshore wind structures could encourage fish aggregation and generate reef effects that attract recreational fishing vessels. These effects would only affect the minority of recreational fishing vessels that reach the wind energy facilities. This would have long-term, negligible benefits on demographics, employment, and economics. Proposed Action structures could increase economic activity associated with offshore sightseeing because these structures create foraging opportunities for harbor and gray seals, sea turtles, bats, northern gannets, loons, and peregrine falcons. Some offshore wind structures would provide the possibility of tours for visitors interested in a close-up view of the wind structures, as has occurred for the BIWF. This would have long-term, negligible beneficial impacts on demographics, employment, and economics.

Views of WTGs could have impacts on businesses serving the recreation and tourism industry. The presence of offshore wind structures could affect shore-based activities, surface-water activities, wildlife and sightseeing activities, diving/snorkeling, and recreational boating (see Section 3.21, *Recreation and Tourism*, and Section 3.22, *Scenic and Visual Resources*, for additional discussion of related impacts). In addition, as noted previously in this section, studies have shown that there is little evidence to indicate the construction and operation of WTGs in offshore areas at the distance the SRWF would be located would have an impact on property values (Atkinson-Palombo and Hoen 2014). Therefore, it is unlikely that the development of offshore wind farms and the presence of structures would have an impact on property values of homes onshore.

The development of offshore wind and presence of offshore structures in general would affect employment and economics by affecting marine-based businesses. Presence of structures would have both beneficial impacts, such as by providing sightseeing opportunities and fish aggregation that benefit recreational businesses, and adverse effects, such as by causing fishing gear loss, navigational hazards, and viewshed impacts that could affect business operations and income. The Proposed Action would have a long-term, moderate impact on demographics, employment, and economics, due to impacts on commercial fishing and for-hire recreational fishing, for-hire recreational boating, and associated businesses.

Traffic: The Proposed Action would generate vessel traffic in the proposed Project Area and to and from the ports supporting offshore project O&M activities. Increased vessel traffic would increase the use of port and marine businesses, including tug services, dockage, fueling, inspection/repairs, and provisioning. The vessel traffic generated by the Proposed Action alone would result in increased business for marine transportation and supporting services in the GAA with continuous, short-term, and negligible beneficial impacts during the O&M phase. Vessel traffic associated with the Proposed Action could also result in short-term, periodic congestion within and near ports, leading to potential delays and an increased risk for collisions between vessels, which would result in economic costs for vessel owners. As a result of potential delays from increased congestion and increased risk of damage from collisions, the Proposed Action would have continuous, short-term, and negligible impacts during operations.

Climate change: Climate models predict climate change if current trends continue. Climate change has adverse implications for demographics and economic health of coastal communities, due in part to the costs of resultant damage to property and infrastructure, fisheries, and other natural resources, among other factors. It is anticipated that there would be a net reduction in GHG emissions that contribute to climate change, and no collective adverse impact on climate change as a result of offshore wind projects. To the degree that offshore wind facilities contribute to the overall effort to limit climate change, these projects would reduce the socioeconomic impacts associated with the effects of climate change. The Proposed Action would have long-term, negligible beneficial impacts on demographics, employment, and economics from these IPFs due to the small reduction in or avoidance of emissions from power generation. Future offshore wind activities would have similar contributions as the Proposed Action but at a larger scale. The contribution of the Proposed Action to the combined impacts from ongoing and planned activities would have a long-term, minor benefit.

3.16.5.3 Conceptual Decommissioning

3.16.5.3.1 Onshore Activities and Facilities

Cable emplacement and maintenance: Onshore cable decommissioning would be similar in nature to the construction and installation related impacts. Impacts during cable decommissioning would be similar to other construction type projects, and could include air emissions, noise, and traffic impacts, as well as visual impacts. However, the decommissioning would be short-term and even shorter-term than construction and is considered a negligible impact.

Land disturbance: The decommissioning phase for onshore activities and facilities would be similar to, or of lesser intensity, than during the construction and installation phase and would occur for a shorter period of time. Potential impacts related to land disturbance would be similar to, or less than under the construction and installation phase, and also short-term, and therefore considered a negligible impact.

Lighting: Lighting in this context primarily refers to aviation safety lighting for the offshore WTGs, and there is not anticipated to be additional lighting for onshore activities and facilities outside of perhaps some lights during the decommissioning period, as needed. The impact of any onshore lighting related to the Proposed Action would be short-term and negligible.

Noise: Noise onshore may be present from the decommissioning activities of the OnCS-DC, onshore transmission cable and onshore interconnection cable, which may include similar activities as during construction and installation. This would include construction-related vehicle noise (i.e., dump trucks, backhoes, concrete saws, air compressors and portable generators), site rehabilitation, and general vehicular traffic. The noise generated during decommissioning of onshore facilities would be short-term, and impacts would be negligible to minor.

Traffic: Traffic in this context primarily refers to land-based vehicular traffic related to the decommissioning of onshore facilities, including the OnCS-DC, onshore transmission cable and onshore interconnection cable, which is assumed to be similar to construction and installation. This may require some detours and/or additional congestion during the period of decommissioning of the onshore facilities along the roadways where the cable would be installed but be similar to a routine construction project. Traffic pattern changes or congestion could affect business activities in the vicinity of the onshore facilities, but impacts would be short-term nature and considered negligible to minor.

3.16.5.3.2 Offshore Activities and Facilities

Cable emplacement and maintenance: The decommissioning of offshore cable for the Proposed Action would temporarily affect commercial fishing and for-hire recreational fishing businesses, marine recreation, and subsistence fishing during cable installation, in a similar manner as during construction and installation but to a lesser degree. Decommissioning activities would have a short-term, localized, minor impact on marine businesses (commercial fishing or recreation businesses). Decommissioning activities could affect fish and mammals of interest for fishing and sightseeing through dredging and turbulence, although species would recover upon completion and removal of the cable. Decommissioning of offshore components for the Proposed Action could therefore have a short-term, minor impact.

Lighting: Lighting in this context refers primarily to the aviation hazard lighting on the WTGs but could also include effects from nighttime lighting associated with vessels and other decommissioning related equipment. The impacts would be primarily to the recreational and commercial fishing, pleasure, and tour boating community. The impact from visual impacts associated with lighting from offshore facility decommissioning would be negligible and the impacts from potential marine-related businesses being impacted would be short-term and minor.

Noise: Noise from decommissioning offshore facilities associated with the Proposed Action could temporarily affect fish and marine mammal populations, hindering fishing and sightseeing near decommissioning activity within the SRWF Lease Area, which could discourage some businesses from operating in these areas (see Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*). It is assumed noise generated during decommissioning would be similar to that experienced during construction. This would result in a localized, short-term, negligible impact on marine-related businesses and therefore demographics, employment and economics, but would return to normal conditions following the completion of decommissioning activities.

Port utilization: The Proposed Action would require port facilities for decommissioning activities related to offshore facilities. It is assumed that the same 10 ports identified for construction and installation would support decommissioning activities. Similar to construction, these ports would require a trained

workforce for the offshore wind industry including additional shore-based and marine workers that would contribute to local and regional economic activity.

These jobs related to decommissioning of offshore facilities would be short-term. As a result of this activity, and offshore wind development in general, investments are being made at many of these ports, which would benefit other port users, including maintenance and dredging of shipping channels. The Proposed Action would have a minor beneficial impact on demographics, employment, and economics from port utilization during decommissioning activities.

Traffic: In this context, traffic is referring to vessel traffic generated during decommissioning of offshore facilities related to the Proposed Action. It is assumed that vessels supporting the decommissioning would originate or terminate at one of the same 10 ports being considered to support the proposed Project during the construction and installation phase. Vessel traffic impacts during decommissioning would be similar to, or less than the impacts during construction and installation and be considered negligible to minor.

3.16.5.4 Cumulative Impacts of the Proposed Action

This section outlines the cumulative impacts of the Proposed Action considered in combination with other ongoing and planned wind activities.

In context of reasonably foreseeable environmental trends, the incremental contributions of the Proposed Action to the combined energy security/generation impacts from ongoing and planned activities including offshore wind. Impacts related to energy generation and security would have long-term, regional, and minor beneficial impacts on demographics, employment, and economics.

The exact extent of land disturbance associated with other projects would depend on the locations of landfall, onshore transmission cable routes, and onshore substations for offshore wind energy projects. Therefore, in context of reasonably foreseeable environmental trends, the incremental impacts contributed by the Proposed Action to the combined land disturbance impacts from ongoing and planned activities including offshore wind would be short-term and noticeable due to the short-term and localized disruption of onshore businesses.

WTG lighting in ongoing and planned offshore wind activities would be visible from the same locations as the Proposed Action. In context of reasonably foreseeable environmental trends, the Proposed Action would contribute a noticeable increment to the combined lighting impacts from ongoing and planned activities including offshore wind, which would be negligible.

In context of reasonably foreseeable environmental trends, the Proposed Action would contribute a noticeable increment to the combined cable emplacement and maintenance impacts on demographics, employment, and economics from ongoing and planned activities including offshore wind, which would be short-term and minor.

There are several wind projects adjacent to or in close proximity to the SRWF Lease Area, and the Proposed Action is anticipated to overlap with construction of these offshore wind projects, potentially contributing to increased noise impacts during simultaneous construction activity (Appendix E). While operational activity would overlap, noise impacts during operations would be far less than during

construction. Therefore, in context of reasonably foreseeable environmental trends, the Proposed Action would contribute a noticeable increment to the combined noise impacts on demographics, employment, and economics from ongoing and planned activities including offshore wind, which would be short-term and negligible.

Other offshore wind energy activity would provide support (either construction support, O&M or both) at the same ports as the Proposed Action as well as other ports within the GAA. Port investments are ongoing and planned in response to offshore wind activity. Maintenance and dredging of shipping channels are expected to increase, which would benefit other port users. In context of reasonably foreseeable environmental trends, the Proposed Action would contribute a noticeable increment to the impacts from other ongoing and planned activities, which would be long term, moderate, and beneficial on port utilization and the associated trained and skilled offshore wind workforce that would contribute economic activity in port communities and the region as a whole.

Offshore structures, including those of the Proposed Action, would affect employment and economics by affecting marine-based businesses. Presence of structures would have both beneficial impacts, such as by providing sightseeing opportunities and fish aggregation that benefit recreational businesses, and adverse effects, such as by causing fishing gear loss, navigational hazards, and viewshed impacts that could affect business operations and income. In context of reasonably foreseeable environmental trends, the Proposed Action would contribute an undetectable increment to the combined impacts on demographics, employment, and economics from other ongoing and planned activities including offshore wind, which would be long-term and moderate due to impacts on commercial and for-hire recreational fishing, for-hire recreational boating, and associated businesses.

In context of reasonably foreseeable environmental trends, the Proposed Action would contribute a noticeable increment to the combined impacts on vessel traffic from ongoing and planned activities including offshore wind, which would be minor during construction and decommissioning and negligible during operations. Increased vessel traffic would produce demand for supporting marine services, with beneficial impacts on employment and economics during all project phases, including minor to moderate beneficial impacts during construction and decommissioning and negligible beneficial impacts during operations. The increased vessel traffic congestion and collision risk would also have long-term, continuous impacts on marine businesses during all project phases, with minor impacts during construction and decommissioning and negligible impacts during operations.

3.16.5.5 Conclusions

Impacts of the Proposed Action

BOEM anticipates that the Proposed Action would have **minor** adverse impacts on demographics within the analysis area. While it is likely that some workers would relocate to the area due to the Proposed Action, this volume of workers would not be substantial compared to the current population and housing supply in the analysis area. In addition, where feasible, as presented within the COP, Section 4.7.1.3 (Sunrise Wind 2023a), to the extent feasible local workers would be hired to meet labor needs for the proposed Project. The Proposed Action would affect employment and economics through job creation, expenditures on local businesses, tax revenues, grant funds, and support for additional regional

offshore wind development, which would have **minor beneficial** impacts. Construction would have a minor beneficial impact on employment and economics due to jobs and revenue creation over the short duration of the construction period. The beneficial impact of employment and expenditures during O&M would less than during construction and have a modest magnitude over the 35-year duration of the proposed Project. Although tax revenues and grant funds would be modest in magnitude compared to other economic activity in the region, they also would provide a beneficial impact on public expenditures and local workforce and supply chain development for offshore wind. If the Proposed Action becomes decommissioned, the impacts on demographics, employment, and economics would be minor and beneficial due to the construction activity necessary to remove wind facility structures and associated equipment both onshore and offshore. After decommissioning, the Proposed Action would no longer affect employment or produce other offshore wind-related revenues.

While the Proposed Action's investments in wind energy would largely benefit the local and regional economies through job creation, workforce development, and income and tax revenue, adverse impacts on individual businesses and communities would also occur. Short-term increases in IPFs such as noise during construction, cable emplacement, land disturbance, and the long-term presence of offshore lighting and structures would have negligible to minor adverse impacts on demographics, employment, and economics. This would include impacts during construction, and to a lesser degree during O&M, to the commercial fishing and for-hire recreational fishing industry and other marine-related businesses that depend on local seafood production. Overall, the impacts on commercial fishing and onshore seafood businesses would have minor impacts on demographics, employment, and economics for this component of the GAA's economy. Although commercial fishing is a relatively small component of the regional economy, it is important to the identity of local communities within the region and analysis area. The IPFs associated with the Proposed Action would also result in impacts on certain recreation and tourism businesses (see also Section 3.21, *Recreation and Tourism*) that range from negligible to minor, with an overall minor impact on employment and economic activity for this component of the analysis area's economy.

Cumulative Impacts of the Proposed Action

In context of other reasonably foreseeable environmental trends, the contribution of the Proposed Action to the impacts of individual IPFs resulting from ongoing and planned activities would range from negligible to moderate adverse impacts and negligible to moderate beneficial impacts. Overall, BOEM anticipates that the Proposed Action and ongoing and planned activities would result in **minor** adverse cumulative impacts and **moderate beneficial** impacts on demographics, employment, and economics in the GAA. The moderate beneficial impacts primarily would be associated with the investment in offshore wind, job creation and workforce development, income and tax revenue, and infrastructure (i.e., ports, etc.) improvements, while the minor adverse effects would result from aviation hazard lighting on WTGs, new cable emplacement and maintenance, the presence of structures, vessel traffic and collisions during construction, and land disturbance. Impacts on commercial and for-hire recreational fishing are anticipated to be moderate on an individual basis, but only one component of the overall impacts. Because they are not expected to disrupt normal demographic, employment, and economic trends, the overall impacts in the GAA likely would be minor adverse. In addition, in context of reasonably foreseeable environmental trends, the Proposed Action and ongoing and planned activities would have a

notable and measurable benefit from construction and operations phase employment and would have moderate beneficial cumulative impacts on demographics, employment, and economics.

3.16.6 Alternative C-1 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

3.16.6.1 Construction and Installation

3.16.6.1.1 Onshore Activities and Facilities

Under Alternative C-1, the potential impacts to demographics, employment and economics from the construction and installation of onshore activities and facilities are anticipated to be the same as described under the Proposed Action.

3.16.6.1.2 Offshore Activities and Facilities

Under Alternative C-1, the construction of the 11-MW WTGs, OCS-DC, and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Removal of 8 WTG positions from Priority Areas would not change the overall number of WTGs associated with the Project. Therefore, the potential impacts from the construction and installation of offshore activities and facilities on demographics, employment and economics are anticipated to be the same as described under the Proposed Action.

3.16.6.2 Operations and Maintenance

3.16.6.2.1 Onshore Activities and Facilities

Under Alternative C-1, the potential impacts to demographics, employment and economics are anticipated to be the same as described under the Proposed Action.

3.16.6.2.2 Offshore Activities and Facilities

Under Alternative C-1, the construction of the 11-MW WTGs, OCS-DC, and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Removal of 8 WTG positions from Priority Areas would not change the overall number of WTGs associated with the Project. Therefore, the potential impacts from the O&M of offshore activities and facilities on demographics, employment and economics are anticipated to be the same as described under the Proposed Action.

3.16.6.3 Conceptual Decommissioning

3.16.6.3.1 Onshore Activities and Facilities

Under Alternative C-1, the potential impacts to demographics, employment and economics are anticipated to be the same as described under the Proposed Action.

3.16.6.3.2 Offshore Activities and Facilities

Under Alternative C-1, the construction of the 11-MW WTGs, OCS-DC, and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. Removal of 8 WTG positions from Priority Areas would not change the overall number of WTGs associated with the Project. Therefore, the potential impacts from the conceptual decommissioning of offshore activities and facilities on demographics, employment and economics are anticipated to be the same as described under the Proposed Action.

3.16.6.4 Cumulative Impacts Alternative C-1

In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-1 to the cumulative impacts on demographics, employment, and economics would be essentially the same as those described under the Proposed Action, which were noticeable to moderate, depending on the IPF.

3.16.6.5 Conclusions

Impacts of Alternative C-1

Alternative C-1 would exclude from development 8 WTG positions in the Priority Areas for the purposes of habitat impact minimization; however, the same overall number of WTGs (94) as the Proposed Action would be installed and operated, along with the same onshore facilities and components. The impacts resulting from individual IPFs associated with Alterative C-1 would result in no change to the overall impact magnitudes to demographics, employment and economics as compared to the Proposed Action. These are anticipated to be **minor** adverse impacts and **minor beneficial** impacts on demographics, employment, and economics.

Cumulative Impacts of Alternative C-1

Overall, Alternative C-1 combined with ongoing and planned activities would result in the same cumulative impacts as described in the Proposed Action, which include **minor** adverse impacts and **moderate beneficial** impacts on demographics, employment and economics in the GAA.

3.16.7 Alternative C-2 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

3.16.7.1 Construction and Installation

3.16.7.1.1 Onshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics for onshore activities and facilities are anticipated to be the same as described under the Proposed Action and Alternative C-1. The relocation of up to 12 WTG positions away from Priority Areas would not change the overall impacts.

3.16.7.1.2 Offshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics are anticipated to be the same as described under Alternative C-1. Both Alternative C-1 and C-2 include the exclusion of up to 8 WTG positions from Priority Areas and the only difference between the alternatives is the relocation of up to an additional 12 WTGs to the eastern side of the Lease Area under Alternative C-2, which would not substantially change impacts.

3.16.7.2 Operations and Maintenance

3.16.7.2.1 Onshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics for O&M onshore activities and facilities are anticipated to be the same as described under the Proposed Action and Alternative C-1. The exclusion of up to 8 WTG positions from Priority Areas and the relocation of up to an additional 12 WTGs would not change the overall impacts.

3.16.7.2.2 Offshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics are anticipated to be the same as described under Alternative C-1. Both Alternative C-1 and C-2 include the exclusion of up to 8 WTG positions from Priority Areas and the only difference between the alternatives is the relocation of up to an additional 12 WTG positions to the eastern side of the Lease Area under Alternative C-2, which would not substantially change impacts.

3.16.7.3 Conceptual Decommissioning

3.16.7.3.1 Onshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics for decommissioning of onshore facilities are anticipated to be the same as described under the Proposed Action and Alternative C-1. The exclusion of up to 8 WTG positions from Priority Areas and the relocation of up to an additional 12 WTG positions would not change the overall impacts.

3.16.7.3.2 Offshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics due to decommissioning of offshore facilities are anticipated to be the same as described under Alternative C-1. Both Alternative C-1 and C-2 include the exclusion of up to 8 WTG positions from Priority Areas and the only difference between the alternatives is the relocation of up to an additional 12 WTG positions to the eastern side of the Lease Area under Alternative C-2, which would not substantially change impacts.

3.16.7.4 Cumulative Impacts of Alternative C-2

In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-2 to the cumulative impacts on demographics, employment and economics would be similar to or slightly less than those described under the Proposed Action, which were noticeable to moderate, depending on the IPF. The relocation of up to 12 WTG positions to the eastern portion of the SRWF Lease Area for the purposes of habitat impact minimization would lessen the impacts under certain IPFs but would not substantially change the incremental contribution to cumulative impacts.

3.16.7.5 Conclusions

Impacts of Alternative C-2

Alternative C-2 would include the exclusion of development of up to 8 WTG positions from Priority Areas and the relocation of up to an additional 12 WTG positions to the eastern portion of the SRWF Lease Area for the purposes of habitat impact minimization; however, the same overall number of WTGs (94) as the Proposed Action would be installed and operated. In addition, there would be no change to the onshore facilities and components. The impacts resulting from individual IPFs associated with Alterative C-2 would be the same as Alternative C-1. The overall impact magnitudes under Alternative C-2 are anticipated to be **minor** adverse impacts and **minor beneficial** impacts on demographics, employment, and economics.

Cumulative Impacts of Alternative C-2

Impacts related to Alternative C-2 combined with ongoing and planned activities would result in the same cumulative impacts as described in the Proposed Action (and Alternative C-1), which include **minor** adverse impacts and **moderate beneficial** impacts on demographics, employment and economics in the GAA.

3.16.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.16.8.1 Construction and Installation

3.16.8.1.1 Onshore Activities and Facilities

Under Alternative C-3, the potential impacts to demographics, employment and economics for onshore activities and facilities are anticipated to be the same as described under the Proposed Action, as well as Alternatives C-1 and C-2. The reduction in the number of WTGs would not change onshore activities or impacts.

3.16.8.1.2 Offshore Activities and Facilities

Under Alternative C-3, the potential impacts to demographics, employment and economics are anticipated to be nearly identical to those described under Alternative C-1 and C-2. Alternative C-3 reduces the number of WTGs that would be installed by between 7 and 14 in total. This reduction in the number of WTGs that would be constructed would slightly decrease the adverse impacts associated with other resource areas, such as commercial fisheries and for-hire recreational fishing and recreation and tourism impacts; however, the incremental reduction in potential adverse impacts would not substantially change conclusions.

3.16.8.2 Operations and Maintenance

3.16.8.2.1 Onshore Activities and Facilities

Under Alternative C-3, the potential impacts to demographics, employment and economics for O&M onshore activities and facilities are anticipated to be the same as described under the Proposed Action, as well as Alternatives C-1 and C-2. The reduction in the number of WTGs would not change onshore activities or impacts.

3.16.8.2.2 Offshore Activities and Facilities

Under Alternative C-3, the potential impacts to demographics, employment and economics are anticipated to be similar as those described under Alternatives C-1 and C-2. Alternative C-3 reduces the number of WTGs that would be installed by between 7 and 14 in total. This reduction in the number of WTGs that would require O&M would slightly decrease the long-term adverse impacts associated with other resource areas, such as commercial fisheries and for-hire recreational fishing and recreation and tourism impacts; however, the incremental reduction in potential adverse impacts would not substantially change conclusions.

3.16.8.3 Conceptual Decommissioning

3.16.8.3.1 Onshore Activities and Facilities

Under Alternative C-3, the potential impacts to demographics, employment and economics for decommissioning of onshore facilities are anticipated to be the same as described under the Proposed

Action, as well as Alternatives C-1 and C-2. The reduction in the number of WTGs would not change onshore activities or impacts.

3.16.8.3.2 Offshore Activities and Facilities

Under Alternative C-2, the potential impacts to demographics, employment and economics due to decommissioning of offshore facilities are anticipated to be similar to those described under Alternatives C-1 and C-2. Alternative C-3 reduces the number of WTGs that would be installed by between 7 and 14 in total. This reduction in the number of WTGs that would require decommissioning would slightly decrease the adverse impacts associated with other resource areas, such as commercial fisheries and for-hire recreational fishing and recreation and tourism impacts; however, the incremental reduction in potential adverse impacts would not substantially change conclusions.

3.16.8.4 Cumulative Impacts of Alternative C-3

In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-3 to the cumulative impacts on demographics, employment and economics would be similar to or slightly less than those described under the Proposed Action (and Alternatives C-1 and C-2), which were noticeable to moderate, depending on the IPF. The reduction of between 7 and 14 WTGs to avoid glauconite sands would lessen the impacts under certain IPFs but would not substantially change the incremental contribution to cumulative impacts.

3.16.8.5 Conclusions

Impacts of Alternative C-3

Alternative C-3 would include the reduction of between 7 and 14 WTGs from primarily the southern and eastern portion of the SRWF Lease Area for the purposes of avoiding glauconite sands. In addition, there would be no change to the onshore facilities and components. The impacts resulting from individual IPFs associated with Alterative C-3 would be similar to, but slightly less adverse than those described under Alternatives C-1, C-2, as well as Alternative B. The overall impact magnitudes under Alternative C-3 are anticipated to be **minor** adverse impacts and **minor beneficial** impacts on demographics, employment, and economics.

Cumulative Impacts of Alternative C-3

Impacts related to Alternative C-3 combined with ongoing and planned activities would result in similar cumulative impacts as described in the Proposed Action (and Alternatives C-1 and C-2), which include **minor** adverse impacts and **moderate beneficial** impacts on demographics, employment and economics in the GAA. The overall reduction in the number of WTGs that would be installed and operated would result in a slight incremental reduction in impacts to certain resources and IPFs, but would not change the overall conclusions.

3.16.9 Comparison of Alternatives

As noted above, most alternatives alone are effectively identical in terms of the level of impact on demographics, employment, and economics. The relocation of WTGs associated with Alternatives C-1 and C-2 could have fewer adverse impacts as it relates to fishing industries supported by the local economy, due to locating WTGs away from popular and productive fishing areas and sensitive habitats. Similarly, the overall reduction of between 7 and 14 WTGs under Alternative C-3 to avoid glauconite sands would have a similar result of fewer adverse impacts. Despite these slightly varied impacts, BOEM anticipates that impacts to demographics, employment and economics would range from minor adverse to minor beneficial for all evaluated action alternatives.

Adverse impacts would result from construction activity (onshore and offshore), port utilization and vessel traffic, noise/lighting, and presence of structures, while beneficial impacts would result primarily from construction activity, job creation, and port infrastructure investment. In combination with reasonably foreseeable trends for the analysis area, impacts to demographics, employment and economics from all evaluated action alternatives and other offshore activity would range from minor adverse to minor to moderate beneficial.

Table 3.16-12 provides an overall summary of alternative impacts.

Table 3.16-12. Comparison of Alternative Impacts on Demographics, Employment and Economics

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: BOEM anticipates that ongoing activities in the GAA (continued commercial shipping and commercial fishing; ongoing port maintenance and upgrades; periodic channel dredging; maintenance of piers, pilings, seawalls, and buoys; and the use of small-scale, onshore renewable energy) would have **minor** adverse and **minor beneficial** impacts on demographics, employment, and economics. *Cumulative Impacts of the No Action Alternative:* BOEM anticipates that the No Action Alternative, when combined with all planned activities (including other offshore wind activities), would result in **minor** adverse and **moderate beneficial** cumulative impacts due primarily to the impacts on commercial fishing	*Proposed Action:* BOEM anticipates that the Proposed Action would have **minor** adverse impacts on demographics within the analysis area. Short-term increases in noise during construction, cable emplacement, land disturbance, and the long-term presence of offshore lighting and structures would have minor adverse impacts on demographics, employment, and economics. The impacts on commercial fishing and onshore seafood businesses would have minor impacts on demographics, employment, and economics for this component of the GAA's economy. The IPFs associated with the Proposed Action would also result in **minor beneficial** impacts on employment and economic activity for this component of the analysis area's economy.	*Alternative C-1:* The impacts resulting from individual IPFs associated with Alterative C-1 would result in no change to the overall impact magnitudes to demographics, employment and economics as compared to the Proposed Action. These are anticipated to be **minor** adverse impacts and **minor beneficial** impacts on demographics, employment, and economics. *Cumulative Impacts of Alternative C-1:* Overall, Alternative C-1 combined with ongoing and planned activities would result in the same cumulative impacts as described in the Proposed Action, which include **minor** adverse impacts and **moderate beneficial** impacts on demographics, employment and economics in the GAA.	*Alternative C-2*: The impacts resulting from individual IPFs associated with Alterative C-2 would be the same as Alternative C-1. The overall impact magnitudes under Alternative C-2 are anticipated to be **minor** adverse impacts and **minor beneficial** impacts on demographics, employment, and economics. *Cumulative Impacts of Alternative C-2:* Impacts related to Alternative C-2 combined with ongoing and planned activities would result in the same cumulative impacts as described in the Proposed Action (and Alternative C-1), which include **minor** adverse impacts and **moderate beneficial** impacts on demographics, employment and economics in the GAA.	*Alternative C-3:* The impacts resulting from individual IPFs associated with Alterative C-3 would be similar to those described under Alternatives C-1 and C-2. The overall impact magnitudes under Alternative C-3 are anticipated to be **minor** adverse impacts and **minor beneficial** impacts on demographics, employment, and economics. The reduction of between 7 and 14 WTGs under Alternative C-3 would lessen adverse impacts for some other resource areas, but not substantially enough to change conclusions. *Cumulative Impacts of Alternative C-3:* Impacts related to Alternative C-3 combined with ongoing and planned activities would result in similar cumulative impacts to those described in the Proposed Action (and Alternatives C-1 and C-2), which include **minor** adverse

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
and for-hire recreational fishing businesses and marine recreational businesses (tour boats, marine suppliers) primarily through cable emplacement, noise and vessel traffic during construction, and the presence of offshore structures during operations.	*Cumulative Impacts of the Proposed Action:* Overall, BOEM anticipates that the Proposed Action and ongoing and planned activities would result in **minor** adverse impacts and **moderate beneficial** cumulative impacts on demographics, employment, and economics in the GAA. The moderate beneficial impacts primarily would be associated with the investment in offshore wind, job creation and workforce development, income and tax revenue, and infrastructure (i.e., ports, etc.) improvements, while the minor adverse effects would result from aviation hazard lighting on WTGs, new cable emplacement and maintenance, the presence of structures, vessel traffic and collisions during construction, and land disturbance.			impacts and **moderate beneficial** impacts on demographics, employment and economics in the GAA.

3.16.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. As a result, BOEM anticipates Alternative C-3b would have negligible impacts on demographics within the GAA, along with some short-term disturbance during construction and long-term visual impacts (i.e., presence of structures and lighting) that may have a **minor** adverse impact on demographics, employment and economics. In addition, impacts to commercial fishing and related onshore seafood businesses would have **minor** adverse impacts to demographics, employment and economics. The overall impacts related to the implementation of Alternative C-3b would be similar to, but slightly less than those described under Alternative B, since less WTGs would be installed.

3.16.11 Proposed Mitigation Measures

No additional measures to mitigate impacts on demographics, employment and economics have been proposed for analysis.

3.16.11.1 Effect of Measures Incorporated into the Preferred Alternative

Since no mitigation measures have been proposed, impacts levels for the Preferred Alternative would remain as described above in Section 3.16.8.

3.18 Land Use and Coastal Infrastructure

Under the Proposed Action, onshore infrastructure would be located in the Town of Brookhaven, Suffolk County, New York, on the south shore of Long Island. The SRWEC would meet landfall at the Smith Point County Park located within the Fire Island National Seashore. An onshore interconnection cable and onshore transmission cable would connect the landfall site to the existing Holbrook substation located within the Town of Brookhaven. The GAA for land use and coastal infrastructure includes the Town of Brookhaven, New York, resources adjacent to the landfall construction area, including land within the Fire Island National Seashore boundary, Smith Point County Park boundary, and Otis Pike Wilderness boundary, 1,000 ft (304.8 m) into the Atlantic Ocean, and 4,000 ft (1,219.2 m) into Great South Bay that is located within the boundary of the fire Island national Seashore, and the ports potentially used for Project construction, O&M, and conceptual decommissioning. Please see Appendix D, Figure D-15 for a detailed overview of the GAA.

3.18.1 Description of the Affected Environment and Future Baseline Conditions

Brookhaven is the most populous of the 10 towns in Suffolk County and is the only one that stretches from the north shore to the south shore of Long Island (NYS 2022). The town is characterized by unique hamlets, villages, and communities; two world renowned research centers, Stony Brook University and Brookhaven National Laboratory; popular beaches; and recreation areas (Brookhaven 2022). The western half of the town has a much higher concentration of development, with the eastern half having a much higher area of preserved recreation and open space (Suffolk County 2016). Commercial, industrial, and institutional land uses predominantly occur directly adjacent to transportation and roadways. Town land use predominantly consists of preserved recreation and open space (43 percent of the acreage of town lands), low-density and medium-density residential areas (21 percent of the acreage of town lands), and vacant land (10 percent of the acreage of town lands) (Suffolk County 2020). There are eight harbors located in Brookhaven on both the north shore and south shore of Long Island, including two on Fire Island: Corey North, Corey South, Davis Park, Forge River, Great Gun, Mt. Sinai, Port Jefferson, and Sandspit (Brookhaven 2022).

The Smith Point County Park is located within the Fire Island National Seashore in the town of Brookhaven. While Smith Point County Park is not owned by the federal government, it is within the boundaries of Fire Island National Seashore. The park is accessible by car via the William Floyd Parkway, and parking is available at the fee-based public Smith Point County Park parking lot (Suffolk County Parks 2018). Public access at the site includes beach access, camping facilities, showers, a playground, and staff present, including lifeguards (Suffolk County Parks 2018). The landing site is proposed to occur in the southeast corner of the public parking lot.

Within the Smith Point County Park is the TWA Flight 800 International Memorial. This space memorializes the victims of TWA Flight 800, which crashed off Fire Island on July 17, 1996 (NPS 2023). This area is located outside of the proposed work area, but adjacent to where construction activities would occur.

The Fire Island National Seashore is a 26-mile-long (41.8-km) protected section of the approximately 30-mile-long (48.2-km-long) Fire Island, separated from Long Island by the Great South Bay. The Fire Island

National Seashore was established "[f]or the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features within Suffolk County, New York, which possess high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban population" (16 *USC* § 459e(a)). The Otis Pike Fire Island High Dune Wilderness Act (enacted December 23, 1980) designated approximately 1,363 ac (551.6 ha) of the Fire Island National Seashore as federally designated wilderness (Otis Pike Wilderness Area) and later expanded the wilderness area to an additional 18 ac (7.3 ha). The Otis Pike Wilderness area is the smallest wilderness area managed by the National Park Service and the only federally designated wilderness area in the state of New York. Figure 3.18-1 denotes the location of the Fire Island National Seashore and Otis Pike Wilderness Area. The Otis Pike Wilderness is located directly west of Smith County Park, and in an area where, per enabling legislation for the Fire Island National seashore, "every effort shall be exerted to maintain and preserve" this area of the seashore "in as nearly [its] present state and condition as possible" (16 *USC* § 459e-6(b)).

The Fire Island National Seashore is characterized by dynamic barrier island beaches, an ancient maritime forest, and historic resources, and contains 17 communities and the Otis Pike Wilderness Area (National Park Foundation 2022). The Fire Island National Seashore has communities, the wilderness area, natural areas, and historical and cultural resources within its boundaries. More than three-quarters of Fire Island National Seashore is marine or estuarine habitat, with 14,644 ac (59.3 km^2) of the park consisting of open water. The Seashore boundary extends 1,000 ft (304.8 m) into the Atlantic Ocean from Moriches Inlet to Robert Moses State Park, and up to 4,000 ft (1,219.2) into the Great South Bay, and Bellport, Narrow and Moriches Bay (NPS 2023). Two bridges connect the island to the mainland where cars can access the island but cannot drive from one end to the other, with the majority of people arriving on the island via ferry or private boat (NPS 2021). Fire Island is a popular tourism destination and day-trip location for recreationalists and beachgoers. The Fire Island Wilderness Visitor Center is located at the southernmost end of the William Floyd Parkway, adjacent to the Smith County Park. The Otis Pike Wilderness Area is accessible year-round, and parking is available at the Smith County Park. It includes a ranger contact station, an exhibit space, and an elevated viewing area.

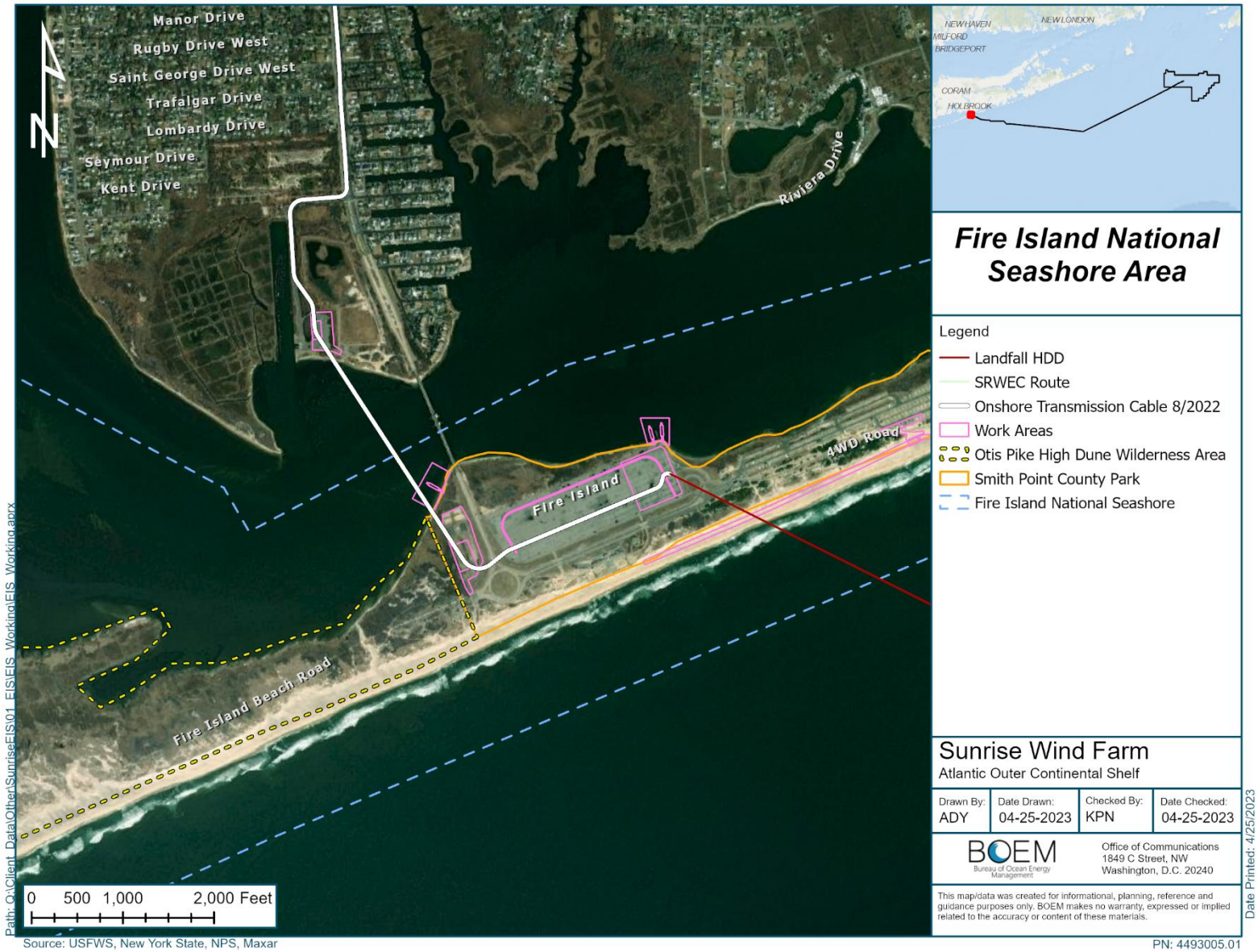

Figure 3.18-1. Fire Island National Seashore Area

Sunrise Wind selected Smith Point County Park as the landfall site, stating that it would provide sufficient area to accommodate onshore HDD operations within developed areas, with minimal disruption to adjacent land uses, and would minimize direct disturbance to natural or cultural resources in the nearshore, coastal, and intracoastal areas. Section 2.2 further describes how Sunrise Wind selected the Smith Point County Park as the landfall site for the Proposed Action.

The onshore cable route between Smith Point County Park and the Holbrook substation is 17 mi (27.4 km). Each of the alternative landfall sites would have an onshore cable route to the Holbrook Substation that is at least 25 mi (40.2 km) in length, creating a greater distance of potential impacts from onshore cable installation. Access to the Landfall Work Area would be through Smith County Park, with the Landfall HDD entry location located in the parking lot. No trenching would occur on the Fire Island National Seashore beach.

From the landing site, the onshore transmission cable would parallel to Fire Island Beach Road within the paved Smith Point County parking lot within the Fire Island National Seashore, crossing under the William Floyd Parkway to a recreational area located to the west of the William Floyd Parkway. The cable would then be routed across the ICW, where it would then run north along East Concourse, north along William Floyd Parkway and Surrey circle, and cross the LIRR via trenchless crossing. The route then would turn west along Mastic Boulevard, north along Francine Places, and cross the Montauk Highway to Revilo Avenue, where it would continue north crossing Sunrise Highway. Then, the LIE Service Road Route turns west along Victory Avenue, where a crossing at Carmans River occurs, until it turns northwest along Horseblock Road. The cable would then cross the LIRR at Manor Road to Long Island Avenue, turn west along the LIE South Service Road, and continue to Waverly Avenue, where it turns south. From Waverly Avenue, the cable would turn west to Long Island Avenue and continue west to Union Avenue, where it would reach the OnCS-DC (see Figure 2.1.2-3).

Land use adjacent to the existing ROW varies, but includes community cultural spaces that are utilized by the public and contribute to the local community culture and environment. The Southaven County Park is located north of the Sunrise Highway and bisected by the Carmans River. It occupies 1,323 ac (535 ha), and includes camping facilities, high-capacity picnic areas, fishing and boating access, and public trails (Discover Long Island 2023). The Wertheim NWR is located south of the Sunrise Highway, straddling the Carmans River. The Wertheim NWR protects 2,550 ac (1,032 ha) of grasslands, oak-pine woodlands, and fresh, brackish, and saltwater wetlands (USFWS 2023). The Brookhaven Fairgrounds are located south of the Long Island Expressway at 440 Express Drive. This area is where the Brookhaven Fair has been held in the past, with the last fair held in 2019. The Long Island Baptist Church is also located adjacent to the proposed onshore transmission route at 125 Long Island Avenue, Holtsville New York 11742. Weekly services and prayer meetings are held at this church (Long Island Baptist 2023).

The OnCS-DC for the Project is proposed to be constructed at the intersection of the Long Island Expressway and Route 97 at the Union Avenue South site in the town of Brookhaven. The OnCS-DC would convert DC power from the onshore transmission cable to AC power at 138 kV. This site would have an operational footprint of up to 6 ac (2.4 ha). This facility would be constructed to support interconnection to the existing Holbrook Substation. This site is in close proximity to the Holbrook Station, approximately 1.0 mile (1.6 km) away, and is currently being utilized for industrial/commercial purposes. The site is maintained, contains gravel and paved locations, multiple buildings, and facilities

associated with various commercial developments. This facility would include all equipment and safety features necessary to connect the SRWEC with the NYISO transmission system (see Figure 2.2-1 in COP; Sunrise Wind 2023).

The onshore interconnection cable would connect the OnCS-DC to the existing Holbrook Substation (see Figure 3.3.1-1 in COP; Sunrise Wind 2023). This cable would be installed underground within a duct bank to the Holbrook Substation and would convey AC power. The number of 138 kV onshore interconnection cables would be 12, with the potential for up to two fiber optic cables under the maximum design scenario.

Additionally, the Project would need to utilize various ports for construction, installation, O&M, and decommissioning activities. Sunrise Wind is evaluating several existing port facilities to support construction activities, located in New York, Connecticut and Rhode Island. Vessels traveling from Europe may also travel to ports in Canada (e.g. for foundation marshalling and/or for material loading for scour protection and secondary cable protection) prior to traveling to the SRWF. At the majority of ports being evaluated, upgrades would not be required. At existing ports where upgrades or modifications would be needed for the Project to proceed, upgrades would either be permitted and undertaken by port owners/operators and/or governmental entities or upgrades would occur in conjunction with other planned offshore wind projects that would be under construction before the SRWF. The primary construction ports expected to be used include Albany and/or Coeymans, New York; Port of New London, Connecticut; and Port of Davisville-Quonset Point, Rhode Island. It is expected that Sunrise would utilize ports that are industrial in nature and have the facilities needed to accommodate decommissioning activities, and that based on current conditions, the ports that would be considered would be the same as those considered for construction activities.

The Port of Albany is in the city of Albany, New York and is a modern, industrial port on the Hudson River. The port is located 124 nm (229.6 km) north of New York Harbor and is upstate New York's largest public port (Port of Albany 2019). Marmen/Welcon, the first Offshore Wind Tower Manufacturer, is located at the Port of Albany, making it a potentially key area for construction of offshore wind projects. The port has more than 400 ac (162 ha) of land and deepwater facilities and is a major port of entry in the United States. The Port of Albany is located at the crossroads of Interstates I-90 and I-87 and two Class 1 rail services have access to the port, making it a convenient location to distribute goods (Port of Albany 2019).

The Port of Coeymans is a port located in Coeymans, New York on the Hudson River, 100 mi (161 km) north of New York City and 10 mi (16 km) South of Albany. The port is industrial and commercial, and the services are centered around large construction projects, small manufacturing, marine construction, aggregates, and disaster recovery projects (Carver Companies 2022). The Port of Coeymans has dock capacity for ships up to 750 ft (228.6 m) in length and has sites set up for storage, fabrication, or final assembly before being loaded on to a ship (Carver Companies 2022).

The Port of New London is an industrial port located in New London, Connecticut near the mouth of the Thames River on the north side of Block Island Sound. The port is one of Connecticut's three deepwater ports and is located at the intersection of maritime access and distribution networks (Connecticut Port Authority 2021). On February 11, 2020, the Connecticut Port Authority, the state's quasi-public agency

who coordinates development of the port, Ørsted, and Eversource Investment, LLC (Eversource) finalized a harbor agreement to redevelop the State Pier in New London into a facility that would facilitate heavy lifting to help support the offshore wind industry (Connecticut Port Authority 2021). The improvements would allow for the port to accommodate heavy-lift cargo and is expected to be completed by 2023. Following this, the Ørsted and Eversource joint venture company would enter into a 10-year lease agreement that would allow for WTG preassembly and staging to occur at the State Pier.

Quonset Point houses the industrial port of Davisville that consists of two piers, a bulkhead, on-dock rail, and laydown and terminal storage located near the mouth of Narragnsett Bay in Rhode Island (Quonset Business Park 2022). Quonset Point played a key role in the development of Deepwater Wind's Block Island Project and served as the principal port for the project's heavy installation (Quonset Business Park 2022). In the summer of 2012, the Port of Davisville invested almost $30 million to improve its facilities, with the principal investment going toward the installation of a 150 metric tonne (330,693 pounds) mobile harbor crane to assist with a wide range of project cargoes (Quonset Business Park 2022).

Port facilities in Connecticut, Massachusetts, Maryland, New Jersey, New York, Rhode Island, and Virginia could potentially support construction and O&M of the SRWF facilities and the SRWEC (see Figure 3.3.10-1 in of COP; Sunrise Wind 2023). The ports are characterized as commercial and industrial in nature, and are generally adjacent to areas where the major land uses are commercial, industrial, or transportation related. Before construction activities begin, SRWF would finalize plans at the major port facilities. For further information on recreational vessel and commercial fishing activities relevant to these ports, see Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*, Section 3.6.3 16, *Demographics, Employment, and Economics*, and Section 3.21, *Recreation and Tourism*.

3.18.2 Impact Level Definitions for Land Use and Coastal Infrastructure

This Final EIS uses a four-level classification scheme to analyze potential impact levels on Land Use and Coastal Infrastructure from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.18-1 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for on Land Use and Coastal Infrastructure. Table G-17 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to on Land Use and Coastal Infrastructure.

Table 3.18-1. Definitions of Potential Adverse and Beneficial Impact Levels for Land Use and Coastal Infrastructure

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	No measurable/detectable change to area land use would occur.	No measurable/detectable change to area land use would occur
Minor	Impacts would be detectable but would be short-term and localized.	Beneficial impacts would be detectable but would be short-term and localized.

Moderate	Impacts would be detectable and broad-based, affecting a variety of land uses, but would be short-term and would not result in long-term change.	A detectable and broad-based benefit that would be short-term and would not result in long-term change.
Major	Impacts would be detectable, long-term, extensive, and result in permanent land use change.	A detectable, long-term, extensive benefit that would result in permanent land use change.

3.18.3 Impacts of Alternative A – No Action on Land Use and Coastal Infrastructure

When analyzing the impacts of the No Action Alternative on land use and coastal infrastructure, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities as the baseline conditions for land use and coastal infrastructure. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities. The Description of the Affected Environment and Baseline Conditions in section 3.18.1 provides an overview of information on trends from past and present activities on existing land use and coastal infrastructure. The GAA (Figure D-15, Appendix D) is within developed communities that would experience potential impacts from development of planned activities and the existence of ongoing activities.

3.18.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for land use and coastal infrastructure in the GAA described in Section 3.18.1, *Affected Environment*, would continue to be affected by ongoing non-offshore wind activities and offshore wind activities. Ongoing non-offshore wind activities within the GAA that contribute to impacts on land use and coastal infrastructure include beach, dune, and berm construction; breach response plans; port expansion; onshore development projects; underwater improvement projects such as dredging; upgrades to roads. The GAA lies within communities that already are highly developed, and it would be expected that construction activities would occur in areas that have previously had development activities occur. However, there is the potential for some development to occur on land that is not already development. It is expected that impacts to land use and coastal infrastructure in the GAA from ongoing activities would be minimal, as the area is already developed and zoning measures in place would help determine which activities would be allowed to occur, and that activities within the GAA that activities and associated impacts are expected to continue are current trends and have the potential to affect land use and coastal infrastructure through land disturbance, lighting, port utilization, noise, and presence of structures.

Ongoing offshore wind activities within the GAA that contribute to impacts on land use and coastal infrastructure include:

- Continued O&M of the Block Island project (5 WTGs) installed in state waters,
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497, and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork Wind Project (12 WTGS and 1 OSS) in OCS0A.

The GAA for land use and coastal infrastructure includes ports that are used for the continued O&M and ongoing construction of wind projects. Ongoing O&M of Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Fork projects would affect land use and coastal infrastructure through the primary IPFs of accidental releases and discharges, land disturbance, lighting, port utilization, presence of structure, traffic, and noise. Ongoing offshore wind activities would have the same type of impacts from the primary IPFs that are described in detail in the following section for planned offshore wind activities, but the impacts would be of lower intensity.

3.18.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impact of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action). BOEM expects planned future offshore wind development activities to affect land use and coastal infrastructure through the following primary IPFs.

Accidental releases and discharges: Discharges and releases of liquids and solid wastes could increase due to future offshore wind activities. The risk would be highest during construction activities, but there would still be the possibility of accidental releases and discharges occurring during operation and decommissioning of offshore wind facilities. Releases and discharges would be minimized with vessels complying with USCG regulations. Impacts to land use and coastal infrastructure would be dependent upon the location that the release or discharge occurs, and the locations of landfall, substations, cable routes, and ports that would be necessary to support offshore wind projects. However, any impacts other than very large spills, would generally be minor, short-term, and localized.

Land disturbance: The installation of onshore transmission cable transmission infrastructure would be required to support future offshore wind projects. This could lead to potential impacts to adjacent properties during construction activities and the potentially during maintenance activities. Impacts would be anticipated to be negligible to minor, localized and short-term during construction or maintenance activities and would be dependent upon the locations of both landfall and offshore transmission cable routes.

Lighting: Offshore WTGs would be equipped with permanent aviation warning lighting that would be visible from some beaches and coastlines. The visibility of the lighting would result in localized, continuous, long-term impacts, but would be dependent upon the distance from shore, topography, and atmospheric conditions. Impacts from lighting could have effects on property values, recreation, and tourism. A University of Delaware study evaluated the impact of approximately 574-ft-tall (175-m-tall) WTGs visible more than 15 mi (24.1 km) from the viewer to beach use and found that impacts would be negligible to tourism and recreation activity (Parsons and Firestone 2018). As currently proposed, the majority of WTG positions for future offshore wind projects in the GAA would be located greater than 15 mi (24.1 km) from coastal viewpoints. See Section 3.22, *Scenic and Visual Resources*, for further discussion on impacts of aviation hazard lighting.

Lighting on the WTGs would come from either standard continuous, medium-intensity red strobe light aircraft warning systems or from short duration synchronized flashing of the ADLS. ADLS would activate aviation warning lights on the WTGs when aircraft approach them and would have less nighttime visual

impacts than standard warning lights. Sunrise Wind has proposed to implement ADLS as an APM, which would result in less impacts to land use from WTG lighting.

Lighting from onshore infrastructure, including new substations, could affect adjacent property use and residential development. However, it is likely that future offshore projects would construct new substations or expand existing substations near existing energy infrastructure in areas where land use regulations allow for such developments. This would lead to negligible to minimal adverse impacts on land uses, dependent upon the location of proposed substations. Generally, impacts would be localized, constant, and long-term.

Port utilization: Future offshore wind projects would utilize various ports to support construction, operation, and decommissioning activities. Some ports would require improvements to occur within existing port facilities and would likely lead to beneficial impacts from greater economic activity and increased employment due to increased port utilization. Increased employment would stem from demand for vessel maintenance services, vessel berthing, loading and unloading activities, warehousing and fabrication facilities for offshore wind components, and other business activity related to offshore wind. Future offshore wind projects may result in dredging and other improvement projects in the GAA. Impacts from these activities would be minimized by state and local agencies through managing port resources and traffic control to ensure continued access to ports and adjacent land uses.

There is the possibility that the construction of multiple offshore wind projects occurring at the same time and relying on the same ports and resources. If this occurs, there could potentially be increases in marine and road traffic, noise, and air pollution in the area, along with the potential for port resources to be stressed. The overall impacts on port utilization would have constant, long-term, beneficial impacts on port utilization due to port improvements and productive uses of the ports. However, there would also be the potential for localized, short-term adverse impacts if individual ports are stressed due to multiple construction activities occurring at the same time.

Presence of structures: Coastal locations in the GAA could have impacts during operations from the presence of offshore WTGs. The presence of structures could have impacts on recreation, tourism, and property values. Some WTGs could be visible from some coastal areas and beaches depending upon distance, vegetation, topography, and atmospheric conditions. See Section 3.22, *Scenic and Visual Resources*, for further discussion on the visual impacts of the presence of WTGs. Impacts to visibility from the presence of structures would be localized, constant, and long-term.

Future offshore wind development would also result in the presence of onshore transmission cable infrastructure and substations. It is expected that new substations or expanded existing substations would occur in locations near existing energy infrastructure in areas where land use regulations allow for such development. It is also anticipated that cable conduits associated with future offshore wind projects would be primarily underground and to the extent possible, co-located with roads or other utilities. This would minimize the impacts to land use and would not affect the established and planned land uses of the area.

Traffic: There could be increased road traffic that could impact land use and coastal infrastructure from the development of future offshore wind projects. There is the potential for occasional disruptions to road traffic during construction, repairs, and maintenance activities of onshore cables. The extent of the

impacts on traffic from future offshore wind projects would be dependent upon the locations of onshore transmission cable routes, locations of landfall, and management plans developed by offshore wind energy developers with local governments.

Noise: Future offshore wind projects would generate noise that could impact land use and coastal infrastructure, primarily through construction activities associated with substation construction and onshore cable trenching. It is not expected that noise from offshore wind farm construction would be loud enough in magnitude to reach shores, and therefore, would not have impacts in the GAA. Noise from onshore construction activities and onshore cable trenching could impact residents', businesses', and tourists' choices of where to live, spend time, and visit. Ongoing noise from human activities, including construction projects and transportation, occurs frequently in the developed areas in the GAA. The intensity and extent of this noise varies depending upon the activity occurring but Impacts from this noise are local and short-term. Noise from ongoing and planned onshore construction activity is expected to be similar to noise from other ongoing projects in the GAAs, with impacts to land use and coastal infrastructure being short-term and minor.

3.18.3.3 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, land use and coastal infrastructure would continue to be affected by existing environmental trends and ongoing activities. Ongoing activities are expected to have continued short-term and permanent impacts on land use and coastal infrastructure. The identified IPFs relevant to land use and coastal infrastructure from ongoing non-offshore wind and offshore wind activities include accidental releases and discharges, lighting, land disturbance, presence of structures, noise, traffic, and port utilization. The No Action Alternative would result in **minor beneficial** and **minor** adverse impacts on land use and coastal infrastructure.

Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and land use and coastal infrastructure would be affected by the relevant identified IPFs. The identified IPFs relevant to land use and coastal infrastructure include accidental releases and discharges, lighting, land disturbance, presence of structures, noise, traffic, and port utilization. Ongoing development and operation of offshore wind projects would support the region's diverse mix of land uses and provides supported for continued maintenance and improvement of coastal infrastructure. There are potential adverse impacts from future offshore wind to land use and coastal infrastructure through accidental releases and discharges during onshore construction, land disturbance during installation of onshore cables and substations, the presence of WTGs on the viewshed, nighttime lighting on WTGs and from onshore construction, and the presence of other structures. Potential beneficial impacts to land use and coastal infrastructure would result from the expansion and productive utilization of ports and associated infrastructure that would be utilized for future offshore wind activity. BOEM anticipates that the cumulative impacts of the No Action Alternative would be both **minor beneficial** and **minor** adverse in the GAA.

3.18.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on land use and coastal infrastructure:

- The time of year which construction occurs. Tourism and recreational activities in the GAA tend to be higher from May through September, particularly from June through August (Parsons and Firestone 2018). If Project construction were to occur during this season, impacts on traffic and land uses during the busy tourist season would be exacerbated.
- Location of the onshore transmission facilities, including sites for OnCS-DC, sites for landfall, and routes for the OTC.
- Construction alternatives utilized for the installation methods of the onshore transmission cable and onshore interconnection cable.
- Port selected for the SRWF Project O&M facility.

Changes to the turbine layout would not alter the maximum potential impacts on land use and coastal infrastructure for the Proposed Action and other alternatives because the capacity or number of turbines would not affect onshore infrastructure or port utilization.

3.18.5 Impacts of Alternative B – Proposed Action on Land Use and Coastal Infrastructure

The Proposed Action would result in the construction of the SRWF. The proposed SRWF would have the potential to result in localized impacts; however, it is not anticipated to change the overall land use and infrastructure within the GAA. The IPFs that are anticipated to have the largest impacts on land use and coastal infrastructure would occur from the presence of onshore structures, the utilization of ports, and the land disturbance that would occur during the installation of the onshore cable. Other IPFs, such as noise and accidental releases, would potentially result in impacts on land use and coastal infrastructure, but of a lesser and/or short-term extent. These IPFs would occur primarily during construction, with the potential for some to occur during O&M activities and decommissioning.

3.18.5.1 Construction and Installation

3.18.5.1.1 Onshore Activities and Facilities

Accidental releases and discharges: Accidental releases and discharges from the Proposed Action from onshore construction activities could include release of fuel/fluids/hazardous materials from the installation of onshore cables and improvements to the substation. Accidental releases and discharges would potentially have negative impacts on land use to the Fire Island National Seashore waters and onshore Otis Pike Wilderness Area. Releases and discharges could result in disruptions to land use in these areas by potentially causing for areas utilized by visitors to be temporarily closed due to the presence of fuel/fluids/hazardous materials and negatively influencing the wilderness area by polluting

the area. All onshore construction activities would be completed in compliance with the New York SPDES General permit.

The OnCS-DC would require mineral oils and sulfur hexafluoride to support safe and efficient operation of the facility equipment. To help mitigate the risk of accidental releases and discharges, Sunrise would install equipment so that it would be mounted on concrete foundations with a concrete secondary oil containment designed in accordance with industry and local utility standards when constructing the OnCS-DC.

Construction of the onshore transmission cable could result in potential accidental releases and discharges. The SRWEC would reach the landfall location via HDD methodology, which involves using drilling heads and reaming tools of various sizes that have drilling fluid comprised of bentonite, drilling additives, and water pumped to the drilling head during operation. If the geology and site is suitable, Sunrise Wind would use a casing pipe to contain and collect drilling fluid and minimize releases and discharges that could impact land use (COP Section 3.3.3.3; Sunrise Wind 2023). Sunrise would prepare and implement an Inadvertent Return Plan where HDD is utilized to minimize the potential risks associated with release of drilling fluids. Sunrise Wind would develop an SPCC Plan to help minimize any potential onshore impacts during construction (COP Table 4.9-1-, Page 4-661; Sunrise Wind 2023). The Onshore SPCC Plan is applicable to the storage, handling, transportation, and disposal of petroleum, fuels, oil, chemicals, hazardous substances, and other potentially harmful substances which may be used or stored during, or in connection with, onshore construction, operation, or maintenance. This Plan addresses measures that would be taken to avoid spills and improper storage or application in the vicinity of ecologically sensitive sites along the ROW and access roads and details the procedures for responding to and remediating the effects of petroleum, fuel, oil, chemical, hazardous substances, and other potentially harmful substance spills per the applicable state and federal laws, regulations, and guidance. The Offshore SPCC Plan outlines measures that would be taken to avoid spills and improper storage or application in NYS coastal waters and details on the procedures for responding to and remediating the effects of petroleum, fuel, oil, chemical, hazardous substances, and other potentially harmful spills per applicable state and federal laws, regulations, and guidance. The overall risk is anticipated to be low due to the nature and quantity of chemicals used and procedures in place for storage, handling, and disposal. Additionally, offshore construction vessels associated with the Project would have an USEPA, USCG, and BOEM compliant OSRP onboard for accidental releases of petroleum, fuels, oil, chemicals, hazardous substances into the marine and coastal environment. With the necessary mitigation steps that Sunrise Wind is proposing to take to help minimize impacts, accidental releases and discharges from the Proposed Action from the construction and installation of onshore activities and facilities would have localized, short-term negligible to minor impacts on land use and coastal infrastructure.

Land disturbance: The SRWEC would be connected to onshore facilities and spliced with the onshore transmission cable at co-located TJB and link boxes located at Smith Point County Park on Fire Island in the Town of Brookhaven, New York. The onshore portion of the SRWEC (up to 1,152 ft [351 m]) would be buried underground up to the TJB. Two segments of the SRWEC-NYS would be installed via the Landfall HDD. The HDD methodology would require temporary use of a Landfall Work Area onshore, within which the TJB would be installed, and HDD construction activities would occur. The SRWEC would land at the landfall location via HDD methodology, would occur within the boundaries of Smith County Park and the

Fire Island National Seashore, and would be adjacent to the Otis Pike Wilderness area (COP Section 3.3.3.3; Sunrise Wind 2023). The Landfall Work Area is located in the eastern area of the Smith Point County Park beach parking lot and accessed from Fire Island Beach Road. The Landfall Work Area would be fenced for security and safety purposes; however, vehicle and pedestrian traffic within the parking lot would be maintained. The Burma Road Pipe Stringing Area is located onshore south of the Smith Point County Park camping area within which the conduit pipe would be placed temporarily prior to maneuvering offshore. The entry location for the Landfall HDD would be in a parking lot 755 ft (230 m) landward from the FIMP Project. The exit location for the Landfall HDD would be 2,525 ft (770 m) seaward from the FIMP Project. The cable would be installed at a depth of approximately 60 ft (18 m) below the 0' datum where the FIMP Project is located.

A temporary landing structure would be installed at Smith Point County Park to aid in the offloading of equipment and/or materials. The temporary landing structure would be a temporary fixed pier, measuring up to approximately 3,872 ft^2 (359 m^2), with dimensions of approximately 16 ft wide by 242 ft long (4.8 m by 73.7 m). The temporary fixed pier would be placed using a crane barge with four spuds each, with a diameter of 30 in (76.2 cm). The transit barge would have four spuds each with a diameter of 30 in (76.2 cm). The maximum mudline temporary footprint for piles and spuds would be approximately 150 ft^2 (13.9 m^2). The temporary landing structure would potentially need to remain in place year-round, but the use of it would be limited to fall, winter, and spring. The temporary landing structure would be used during two construction periods.

This landfall site was selected by Sunrise Wind as the preferred landfall site in the COP as it minimizes direct disturbances to natural or cultural resources in the nearshore and coastal areas and has minimal interruptions to existing nearby land uses, when compared to the other five landfall sites considered along southern Long Island. Smith Point County Park provides sufficient area to accommodate onshore HDD operations within developed areas, as opposed to areas that have not been developed at the other landfall sites considered, with minor to moderate disruption to adjacent land uses. This site was chosen as favorable because of its distance from existing sand borrow areas, mapped shipwrecks or obstructions and recreational boating activity, and due to minimal impacts on natural resources. Smith Point County Park is a public recreation facility and based on information from the Town of Brookhaven Division of Public Information (2020), land use within the area is characterized as "Recreational and Open Space." Zoning in the vicinity is characterized as Commercial Recreation, which is consistent with the zoning of multiple parks and campground sites located throughout the Fire Island National Seashore. The proposed nearshore portion of the HDD would traverse through Fire Island National Seashore through an area over which the United States holds an easement. NPS exercises authority over the National Park System. While Smith Point County Park is not owned by the federal government, it is within the boundaries of Fire Island National Seashore and portions of the SRWEC-NYS would be located under the seafloor within Fire Island National Seashore, in an area where the United States holds an easement for the use and occupation of lands for the purposes of Fire Island National seashore. This easement on the Atlantic Ocean side extends from mean high tide to 1,000 ft (304.8 m) out and on the bay side. Relevant to the proposed activity, the NPS also administers waters subject to the jurisdiction of the United States located within the boundaries of Fire Island National Seashore. Those boundaries are described in 16 *USC* 459e(b). Sunrise Wind submitted an application for special use permits for temporary construction activities and a ROW Permit pursuant to 54 *USC* § 100902 in September 2021, and the application was

deemed complete by NPS in June 2022 (COP Section 1.4; Sunrise Wind 2023). A right-of-way permit would be required for the transmission cable and conduit to reside in lands where the United States holds an easement, i.e., from the mean high water line to 1,000 ft (304.8 m) into the Atlantic Ocean. Special use permits for construction would be required for construction (1) on those same lands and within the associated water column, and (2) within waters in the intracoastal waterway that are subject to the jurisdiction of the United States and within the boundaries of Fire Island National Seashore. Construction activities with land disturbance would occur within Smith Point County Park.

Sunrise Wind has proposed, as an APM to land disturbance, that all construction-related impacts to roadways and parking lots would be restored to pre-construction conditions and in accordance with *NYSDOT Standard Specifications for Construction Materials* and in coordination with local entities. Locations used for HDD work areas and temporary laydown yards would be restored to pre-existing conditions in accordance with landowner requests and permit requirements.

Land uses would be impacted during construction activities, including disturbances to portions of the parking lots causing interruptions to recreation activities at both Smith County Park and the Fire Island National Seashore, and would be moderate, short-term during the period of construction (COP Section 2.2.1.1; Sunrise Wind 2023). The landfall site within Smith Point County Park is adjacent to the federally designated Otis Pike Wilderness Area. The closest Project disturbance to the Otis Pike Wilderness Area would occur approximately 65 ft (20 m) east of the wilderness boundary. All site disturbances would be confined to the Project's Limit of Disturbance, per requirements from the state of New York. The Limit of Disturbance would be delineated prior to construction activities occurring, and would be inspected and maintained throughout to ensure that direct impacts would not occur to the wilderness area. An existing split rail and chain link fence provide an additional barrier around the west areas of the Limit of Disturbance, helping contain impacts. Land uses in the adjacent wilderness area would be indirectly impacted due to land disturbance activities from construction activities but would not prevent access to areas during construction activities. These impacts to adjacent land uses are anticipated to be moderate during the construction period. Sunrise Wind has proposed an APM to minimize impacts that states that the construction of the Landfall and ICW HDD is expected to occur outside the summer tourist season, which is generally between Memorial Day and Labor Day and that the construction schedule for the remaining onshore Facilities would be designed to minimize impacts to the local communities to the extent feasible. Landfall HDD construction is expected to take three to four months to be completed. While the busiest months at Fire Island National Seashore are July and August, visitors come to the area throughout the entire year, so there would be impacts to recreation and tourism, which are existing land uses for the area (NPS 2023). The Otis Pike Wilderness Area is the only federally designated wilderness in the State of New York, and reports both recreational and non-recreational visitors to the area throughout the entire year. This area also is the location of the Fire Island Wilderness Center, which serves as the eastern entry point to the Otis Pike Fire Island Dune Wilderness (NPS 2023). The Proposed Action would include short-term interruptions to current use of these spaces, as construction activities would temporarily change visitor experience, but would still allow for access and recreation and tourism activities and other existing uses of the area to occur.

Temporary laydown areas at Smith Point County Park would be restored to the previous condition once construction activities have been completed. The presence of other construction activities, including impacts from construction activities at Smith Point County Park and within the boundaries of the Fire

Island National Seashore would be short-term and minor to moderate to land use and coastal infrastructure. The TWA Flight 800 International Memorial would be impacted with construction activities at the landfall site, where the export cable makes its sea-to-shore transition via HDD. This area would be indirectly impacted during this phase of construction due to disruptions to current land uses, and these impacts would be moderate, short-term, and localized. After construction activities are complete, it is not anticipated that the Proposed Action would have any permanent impacts to the area.

The onshore transmission cable route of the Proposed Action has been sited within existing disturbed ROW to the greatest extent possible. The onshore transmission cable would be located underground. Construction of the onshore transmission cable and onshore interconnection cable would involve site preparation, trench excavation, duct bank and vault installation, cable jointing, final testing, and restoration. Laydown yards utilized for construction activities would be short-term, and would generally be located in areas that are previously disturbed industrial sites or locations containing open lands. Sunrise Wind identified one laydown yard, Zorn, to support cable installation as well as other Project activities (COP Figure 3.2.1-1 and COP Section 3.3.2.1; Sunrise Wind 2023). Upon completion of construction, temporary laydown yards would be restored to pre-existing conditions in accordance with landowner, local, and state requirements (COP Section 3.3.2.3; Sunrise Wind 2023). Southaven County Park, Wertheim NWR, the Brookhaven Fairgrounds, and the Long Island Baptist Church are all important community spaces that are located adjacent to the onshore transmission cable route of the Proposed Action that would experience impacts during construction of the OTC. The onshore transmission cable would be installed in an underground duct bank consisting of concrete encased conduits, utilizing cable splice vaults for installation and maintenance access. Each splice vault would be accessible by up to two utility hole covers visible from the surface and spaced approximately 0.5 mi (0.8 km) apart, with the exception of at the trenchless crossings. Outside of sensitive areas, excavators would be used for excavation of trenches and splice vault installation. Land disturbance associated with this excavation is considered temporary, as these areas would be backfilled and surface conditions restored to pre-existing conditions in coordination with local entities, after construction is completed. Sunrise Wind would utilize trenchless crossing installation to avoid sensitive environmental resources or other physical obstructions (e.g., major highways, railroads) at certain crossing locations. The trenchless installation(s) would either consist of excavating a pair of pits on either side of a crossing or jacking pipe under a crossing (e.g., railroad), which would require additional temporary disturbance areas to support the setup of equipment necessary to perform each crossing. The Project's HDDs are described in detail in the HDD Work Plan provided as Appendix NN of the EM&CP 2. The remaining trenchless crossings are shown on the *Onshore Transmission Cable Drawings* provided as Appendix KK of the EM&CP 2. Impacts from construction activities would result in short-term impacts to neighboring land uses through construction noise, lighting, vibration, dust, travel delays, and changes in the visual characteristics. Construction of the cables would occur in areas where land is already disturbed and much of the land use is designated for roadways, utilities, or other industrial uses. The land uses of the Proposed Action are generally compatible with existing and proposed land uses within the GAA. However, some construction activities would occur in areas utilized for recreation and tourism and neighbor residential areas and adjacent areas would experience indirect impacts from construction activities. Impacts from construction would be short-term and minor to moderate to land use and coastal infrastructure during the construction period.

The construction of onshore substations would result in short-term impacts due to construction activities and permanent impacts due to the facilities that would be completed after construction. Construction of the onshore substation requires a site that is within close proximity to the Holbrook Substation, a parcel of approximately 6 to 10 ac (0.02 to 0.04 km^2), suitable parcel shape, suitable ground conditions, appropriate zoning and land use compatibility, and avoidance of disturbance to sensitive natural and cultural resources (COP Section 2.2.1.1; Sunrise Wind 2023). The Union Avenue site, located in Brookhaven, New York, and bordering the town of Islip, New York, would be in an area of existing industrial development, and is currently being utilized for industrial and commercial development (Suffolk County 2020). Therefore, construction at this site would be compatible with existing land uses and the potential impacts on land use would be minor. Interconnection would also occur at the exiting Holbrook substation. Any upgrades or construction activities associated with the existing Holbrook site would be compatible with existing uses and would result in minor impacts to land use and coastal infrastructure.

Lighting: Onshore construction activities would have general yard lighting present, but lighting would be minimal. Additional lighting may be required if construction activities are occurring at night or if the contractor deems additional lights necessary for safety and security purposes. Sunrise Wind would follow state and local requirements for lighting otherwise (COP, Section 3.3.1; Sunrise Wind 2023). Impacts to land use and coastal infrastructure from lighting during construction activities should be short-term and negligible to minor.

Noise: Construction of onshore facilities would generate noise from HDD operations, installation of the onshore transmission cable and onshore interconnection cable, installation of the OnCS-DC, and vehicular traffic. Construction activities that occur at all trenchless crossings would exceed the NYSDEC criterion of 65 dB in the proximity of noise sensitive receptors if left unmitigated. BMPs would be implemented to reduce noise at all trenchless crossing locations along the onshore transmission cable route. Installation of the OnCS-DC would occur during daytime hours, making it exempt from both Suffolk County and the Town of Brookhaven noise ordinances. However, per NYSDEC policy of limiting levels to 65 dB at residential properties and 79 dB at industrial properties, BMPs would be implemented to minimize noise. Noise levels at noise sensitive receptors are anticipated to be similar to existing conditions. Onshore construction activities would occur adjacent to the Otis Pike Wilderness Area, an area that is managed by the NPS. The NPS utilizes the Acoustical Toolbox: Recommendations for Reducing Noise Impacts in National Parks to help reduce noise pollution and increase opportunities for visitors to hear unique natural and cultural sounds in the park (NPS 2010). Sunrise Wind would consult with NPS on planned construction activities to ensure noise impacts to the Otis Pike Wilderness area are minimized to the extent practicable during construction to the Project and it is anticipated that the NPS would utilize the Acoustical Toolbox as appropriate to guide these recommendations.

Onshore construction activities would also increase vehicle noise, particularly in the area surrounding Smith Point County Park, in some residential areas in the Town of Brookhaven, New York, and in other locations that are characterized as community spaces and utilized by the public. Increased noise from construction activities would influence the use of the TWA Flight 800 International Memorial, Fire Island Wilderness Center, Smith Point County Park, Southaven County Park, Wertheim NWR, the Brookhaven Fairgrounds, and Long Island Baptist Church during construction activities. Access to the landfall area would be maintained through Smith County Park and would not traverse portions of the Otis Pike

Wilderness area or other portions of the Fire Island National Seashore. Vehicles would include heavy equipment, such as excavators, cranes, dump trucks, and paving equipment, and the increased noise levels are anticipated to be similar to standard utility or roadway construction work (COP Section 4.2.3.3; Sunrise Wind 2023). Construction activities associated with site preparation at HDD and horizontal auger boring sites would generate noise of approximately 84 dB at a distance of 50 ft (15 m) after implementing noise control strategies. Permissible noise limits are not expected to be exceeded at the Landfall HDD, the ICW, HDD, or TCPs along the onshore interconnection cable route since the specified controls are anticipated to reduce noise at NSRs below permissible levels. Mitigative measures would be implemented to attenuate construction noise from drilling operations below permissible levels (COP Appendix I2; Exponent Engineering P.C. 2022). Impacts from noise would be short-term, localized, and minor to moderate on land use and coastal infrastructure during onshore construction activities.

Port utilization: Under the Proposed Action, the anticipated primary construction ports that would be used include Albany and/or Coeymans, New York; Port of New London, Connecticut; and Port of Davisville-Quonset Point, Rhode Island. At these ports, there would not be a need for upgrades beyond what has already occurred or upgrades that are currently occurring to support the construction of the SRWF. For example, the Port of New London is redeveloping the State Pier into a facility to accommodate heavy lifting to help support the offshore wind industry and is expected to have improvements completed by 2023 (Connecticut Port Authority 2021). Additionally, the Port of Davisville recently invested almost $30 million to improve its facilities to accommodate a wide range of projects, including offshore wind (Quonset Business Park 2022). Use of these ports during construction activities could result in minor beneficial impacts due to the increased use and associated economic benefits. These ports are expected to be used during construction but would not be dedicated solely to use of the Project. Construction activities occurring at ports could result in noise, vibration, and vehicle traffic at the ports. However, these impacts are typical for industrial port, and would result in negligible impacts to land uses or use of coastal infrastructure.

Presence of structures: The Proposed Action has a landfall location at Smith Point County Park in Brookhaven, New York. Construction at the landing site would lead to short-term disturbances to neighboring land uses, including recreation uses and residential uses, through construction noise, vibration, dust, and increased traffic in the vicinity of the construction activity. Sunrise Wind proposes as an APM to utilize landfall construction methods that would minimize impacts on land use, and areas would be restored to their previous condition after construction activities are complete. Under the Proposed Action, the onshore transmission cable and onshore interconnection cable would be located underground and generally in areas where land is already disturbed and designated for roadways, utilities, or other industrial uses. However, some construction activities would occur in areas utilized for recreation and tourism and residential areas. Impacts from onshore construction activities would be short-term, minor, and would stem from construction noise, lighting, vibration, dust, travel delays, and changes in the visual characteristics.

The Union Avenue site of the OnCS-DC would have an operational footprint of up to 6 ac (2.4 ha) and be sited in an area that is currently used for industrial/commercial development. The site is bound by areas of commercial and industrial development. Since the OnCS-DC is proposed to be built on a previously developed site, there would be minimal change to existing land use. Two laydown yards, Northville and Zorn, are previously disturbed parcels and would be used to support construction activities. Northville is

an industrial site that was previously cleared and graded to support various activities at the existing fuel terminal. Zorn was previously cleared and graded to support the stockpiling of materials, parking, and equipment storage during construction of the CLIEC complex on Zorn Boulevard.

Onshore construction activities associated with the Proposed Action would result in short-term or permanent impacts to land use. Under the Proposed Action, Sunrise Wind proposes a construction schedule to minimize onshore construction activities during the peak tourism and recreation season from May to September. Expected impacts to existing land use during onshore construction activities include short-term increases in noise levels, lighting, and traffic. Sunrise Wind would implement BMPs to help minimize impacts to surrounding land uses and coastal infrastructure. Onshore construction activities would not change existing land uses. Therefore, the onshore construction would have short-term, minor adverse impacts on land use and coastal infrastructure.

Traffic: Onshore construction activities within and adjacent to existing roadways could result in short-term, localized impacts to traffic from activities such as lane closures, shifted traffic patterns, or closed roadways. Vehicular traffic associated with construction activities would be comparable to typical roadway or utility construction work that would occur in a congested region. As stated in the COP (COP Section 4.2.7.3; Sunrise Wind 2023), the onshore construction activities would comply with local ordinances to the extent practicable, and would need to adhere to local ordinances. The onshore transmission cable route would travel up to 17.5 mi (28.2 km) in length from the Landfall Work Area to the OnCS-DC (COP Section 3.3.2; Sunrise Wind 2023). From the Landfall Work Area, the onshore transmission cable would run parallel to Fire Island Beach Road within the paved Smith Point County parking lot, crossing under the William Floyd Parkway to a recreational area located to the west of William Floyd Parkway. The onshore transmission cable would be routed across the ICW via the ICW HDD to a paved parking lot within the Smith Point Marina along East Concourse Drive. From the ICW Work Area, the onshore transmission cable would turn north along East Concourse and north along William Floyd Parkway to the intersection with Surrey Circle. The onshore transmission cable would be routed along Surrey Circle and would continue north along Church Road then turn west along Mastic Boulevard, north along Francine Place, to the intersection with Montauk Highway. It would cross Montauk Highway to Revilo Avenue and would continue north along Revilo Avenue to the work area for the Sunrise Highway crossing. The onshore transmission cable would then cross Sunrise Highway via trenchless methods to Revilo Avenue, continuing north to the intersection with Victory Avenue and then continue west on Victory Avenue to Horseblock Road, crossing the Carmans River via HDD. The onshore transmission cable would continue northwest along Horseblock Road to Manor Road, then turn north onto Manor Road and cross the LIRR to Long Island Avenue via trenchless methods. The onshore transmission cable would then turn west along the LIE Service Road, then turn south on Waverly Avenue to Long Island Avenue. The onshore transmission cable would then turn west on Long Island Avenue to Union Avenue and reach the Union Avenue site. Construction activities along these roadways and parking lots could lead to increases in traffic and limitations of parking availability in the vicinity of construction activities, and in particular, along the onshore transmission cable route. However, Sunrise Wind has committed to maintaining access to all roads and the Smith Point County Park parking lot during construction, so no road closures would be required, which helps minimize impacts to traffic. Sunrise Wind proposed an APM to allow for traffic to move safely; traffic control measures, such as signage and traffic flaggers, would be used wherever necessary. Traffic control measures to address

traffic flow in and around construction areas would be developed as part of the MPT Plan. Proper traffic control measures would be utilized to ensure the movement of traffic and to mitigate impacts on bus route schedules. Access to bus stops would also be maintained or temporarily relocated during construction, thereby minimizing impacts to bus stops and bus stop access. As stated in the COP (COP Section 4.8.2.2; Sunrise Wind 2023), Sunrise Wind would use commercially-reasonable efforts to maintain at least one travel lane of traffic in the section(s) of the road(s) in which construction crews are working; however, during certain periods of work, short-term road closures may be necessary. Sunrise Wind would develop a MPT Plan within the Project's EM&CP that describes measures to minimize and mitigate for potential impacts to land transportation to the maximum extent practicable during construction (COP Section 4.8.2.2; Sunrise Wind 2023). Roadways would be returned to pre-construction conditions and would not result in changes to the existing land use.

It is anticipated that there would be short-term increases of vehicular traffic in the area around Smith Point County Park, including the Fire Island National Seashore and along the route of the OTC. Construction of the Onshore Facilities would result in short-term reduction in access to recreational areas, including portions of the parking lot at Smith Point County Park, with the level of impact from traffic varying depending on the location, construction activity occurring, and time of year. Access to Smith Point County Park and the Fire Island National Seashore would still be maintained throughout construction activities, however, partial areas of the parking lots may be closed during the offseason time. Sunrise Wind would also implement BMPs and proposes that the construction of the Landfall and ICW HDD is anticipated to occur outside the summer tourist season, which is generally between Memorial Day and Labor Day. The construction schedule for the remaining onshore Facilities would be designed to minimize impacts to the local communities to the extent feasible. Construction activities would still result in disruptions to parking and traffic flow in Smith Point County Park, the Fire Island Wilderness Center, and along the route of the OTC. Sunrise Wind anticipates coordination with the NPS, Federal Highway Administration (FHWA), New York State Department of Transportation (NYSDOT), and local Departments of Public Works on bridge use, LIE crossing, and local roads for construction-related activities, and would implement BMPs to the extent practicable to minimize impacts in coordination with these agencies. After construction activities are completed, roadways would be returned to pre-construction conditions. Impacts to traffic would be short-term and localized would have short-term, moderate adverse impacts on land use and coastal infrastructure.

3.18.5.1.2 Offshore Activities and Facilities

Accidental releases and discharges: The construction of offshore facilities could result in accidental discharges and releases of fuels, fluids, and hazardous materials that could impact land use. Sunrise Wind would manage accidental releases or discharges during offshore construction activities through an Emergency Response Plan/OSRP, an APM that would minimize impacts from accidental releases and discharges to land use and coastal infrastructure. All construction vessels would be required to comply with applicable federal and state regulations and standards for the prevention and control of spills and discharge. Accidental releases from the Proposed Action on land use and coastal infrastructure would have short-term, localized, negligible to minor impacts.

Lighting: Offshore construction activities would result in increased vessel and air traffic that could be visible from some coastlines and elevated areas within the GAA and offshore nighttime construction

lighting. The visibility would be dependent upon distances from the viewer, vegetation, topography, weather, and atmospheric conditions. The increased presence of lighting could result in minor impacts to land use through impacts on recreation, tourism, and changes in property values if the presence of lighting influences the decisions of visitors and those purchasing property. The USCG maintains a listing of all coastal light sources, which includes offshore structures such as buoys, markers, and lighthouses, and indicates that there are lighted buoys and markers present in the GAA (USCG 2022). Visual impacts from lighting are further discussed in Section 3.22, *Scenic and Visual Resources*. Lighting from offshore construction activities would have short-term, minor impacts on land use and coastal infrastructure.

Noise: The Proposed Action would comply with NYSDEC and local noise regulations to the extent practicable to help minimize the impacts to nearby communities. Activities associated with offshore construction of the Proposed Action would generate noise. However, these activities would occur at a significant distance away from existing land use. For example, the exit side of the Landfall HDD is located approximately 0.5 mi (800 m) offshore. Construction at this site would produce a sound level of approximately 60 dB or less at the nearest shoreline, which is below all applicable criteria (COP, Section 4.2.3.3; Sunrise Wind 2023). This would result in short-term, negligible impacts to land use and coastal infrastructure as noise levels from offshore construction activities should not change existing land use or coastal activities.

Port utilization: The Proposed Action would include increased utilization of ports that are already industrial or commercial in nature. Impacts to land use and coastal infrastructure would include increased vehicle traffic to and from the ports, increased construction noise and vibration at the ports, and increased vehicular emissions (BOEM 2016). However, these impacts would be minor and typical of activities that already occur at these ports and would not change the existing land use. The existing land uses meet the goals and zoning criteria of the locations of the ports. Increased port utilization and improvements could also lead to minor beneficial impacts through the support of designated uses and infrastructure improvements.

Traffic: Offshore construction activities would result in increased vessel and air traffic for construction equipment and supplies. This increased vessel and air traffic could be visible from coastal and onshore locations within the geographic area, but would not be expected to have impacts on land uses and coastal infrastructure. Offshore construction activities could result in increases in vehicle traffic around ports utilized for construction activities. However, these impacts would be short-term, localized, and negligible, and would be occurring in areas that are utilized for industrial or commercial land uses.

3.18.5.2 Operations and Maintenance

3.18.5.2.1 Onshore Activities and Facilities

Accidental releases and discharges: Operation of the OnCS-DC could result in the release of fuel/fluids/hazardous materials. Accidental releases and discharges would potentially have negative impacts on land use to the Fire Island National Seashore waters and onshore Otis Pike Wilderness Area. Releases and discharges could result in disruptions to land use in these areas by potentially causing for areas utilized by visitors to be temporarily closed due to the presence of fuel/fluids/hazardous materials and negatively influencing the wilderness area by polluting the area. However, to help minimize the risk

of this, equipment to operate the OnCS-DC would be mounted on concrete foundations with a concrete secondary oil containment designed in accordance with industry and local utility standards (COP Section 3.3.1.1; Sunrise Wind 2023). Under the Proposed Action, onshore facilities would be designed in accordance with National Electric Safety Code, American National Standards Institute/Institute of Electrical and Electronics Engineers Standards and New York Independent System Operation requirements to help minimize impacts (COP Section 3.3.1; Sunrise Wind 2023). Therefore, O&M activities would have negligible adverse impacts on land use and coastal infrastructure.

Land Disturbance: The OnCS-DC would result in a permanent structure and site and associated infrastructure. After onshore facilities have been installed, adjacent land uses would not be changed, and it is not expected that coastal infrastructure would be affected. Onshore facilities would be located in areas compatible with their intended land uses, and areas where construction activities had occurred would have been restored back to their previous uses. The OnCS-DC would be located in land use areas designated for commercial and industrial land use and would be connected to the existing Holbrook Station. The Proposed Action would result in new infrastructure and uses that are compatible with existing land uses. Due to this, potential adverse impacts on land use and coastal infrastructure would be minor.

Lighting: Routine operations at the OnCS-DC would have security lighting present. However, yard lighting would be minimal at night and subject to state and local requirements. As an APM (COP Section 3.3.1; Sunrise Wind 2023), Sunrise Wind proposes to implement shielding to security lighting for mitigating light pollution. Facilities would be located in areas that are already used for commercial and industrial land uses, and the presence of security lighting should not change the character of the area. Therefore, impacts from lighting at onshore facilities would be negligible on land use and coastal infrastructure.

Noise: During O&M, a new noise source would be anticipated to regularly occur from the operation of the OnCS-DC from the converter transformers, reactors, filters, and outdoor cooling equipment associated with the valve hall. Other noises associated with the OnCS-DC would not be anticipated to add significant contributions to the overall sound levels in the vicinity of the facility. Modeling activities have found that in-air noise from the OnCS-DC associated with the Proposed Action would range from 28 to 67 dB, which would result in a sound level of 42 dB at the closest residence, a 9 dB increase in the total sound level relative to existing conditions. The predicted total sound levels of the OnCS-DC comply with all applicable criteria as specified by the USEPA, NYSDEC, and the Town of Brookhaven (COP Section 4.2.3.2; Sunrise Wind 2023). Any routine O&M activities of the onshore transmission cable and onshore interconnection cable may result in short-term, localized noise to adjacent areas. Impacts from noise from O&M activities to land use and coastal infrastructure are anticipated to be minor adverse.

Port utilization: The Proposed Action would result in the Project having an onshore O&M facility located at an existing, industrial port. The Proposed Action's offshore facilities would require daily activity to occur at the O&M facility. The facilities needed to support the O&M facility would be consistent with the range of land uses that already occur at the proposed ports. The increased activity would reinforce the designated land use of the port, support jobs, and would provide a source of investment to coastal infrastructure. This would have minor, beneficial impacts to land use and coastal infrastructure.

Presence of structures: Onshore facilities would be located primarily in areas that are already used for commercial and industrial purposes, so the OnCS-DC structure and land use would be compatible with adjacent areas. The existing use of the proposed location for the OnCS-DC is zoned for commercial and industrial uses, and therefore, would not change the current land use of the proposed site. Once construction activities are completed, the onshore transmission cable and onshore interconnection cable would be located primarily underground in already disturbed areas and existing ROWs when practicable. With compatible OnCS-DC structure for commercial and industrial uses and underground facilities, the anticipated impacts would be negligible to land use and coastal infrastructure.

Traffic: Onshore facilities would require periodic maintenance and inspection activities that would require the use of construction vehicles and equipment that could temporarily impact traffic. These impacts would be expected to be similar to other routine utility and construction activities and would lead to negligible adverse impacts to land use and coastal infrastructure.

3.18.5.2.2 Offshore Activities and Facilities

Accidental releases and discharges: O&M activities associated with offshore facilities have the potential to result in accidental discharges and releases of fuels, fluids, and hazardous materials that could impact land use. Sunrise Wind would manage accidental releases or discharges through an Emergency Response Plan/OSRP if needed, an APM that would minimize impacts from accidental releases and discharges to land use and coastal infrastructure. Accidental releases would have short-term, localized, negligible to minor impacts depending upon the size of the release.

Lighting: The Proposed Action would include the installation and continuous use of aviation hazard avoidance lighting on WTGs during low-light nighttime conditions. Please see Section 3.22, *Scenic and Visual Resources*, for further discussion on the impacts to visual resources from lighting. During operations, lighting from up to 94 WTGs and one OSC-DC structure could be visible from coastal locations within the GAA depending upon distance of the viewer, vegetation, topography, weather, and atmospheric conditions. To help minimize impacts, Sunrise Wind proposes to implement ADLS as an APM, which would result in aviation obstruction lights being turned on and off when aircraft are in proximity of the wind farm. This could result in the lights being on for a shorter duration of time, thus reducing the impacts on land use and coastal infrastructure. This lighting could result in impacts to recreation and tourism activities in the GAA and has the potential to effect property value and use. The impacts of offshore facility lighting would result in long-term negligible to minor impacts on land use and coastal infrastructure.

Port utilization: The Proposed Action would result in the Project having an onshore O&M facility located at an existing, industrial port. The Proposed Action's offshore facilities would require daily activity to occur at the O&M facility. The facilities that would need to support the O&M facility would be consistent with the range of land uses that already occur at the proposed ports. The increased activity would reinforce the designated land use of the port, support jobs, and would provide a source of investment to coastal infrastructure. This would have minor, beneficial impacts to land use and coastal infrastructure.

Presence of structures: The Proposed Action would result in up to 94 WTGs and one OSC-DC present in the offshore environment that could be visible from coastal locations within the GAA depending upon the distance of the viewer, vegetation, topography, weather, and atmospheric conditions. The presence

of structures could result in impacts to recreation and tourism activities in the GAA and has the potential to effect property value and use. Please see Section 3.22, *Scenic and Visual Resources*, for further discussion on the impacts to visual resources from the presence of structures. A University of Delaware study evaluated the potential impacts of visible offshore WTGs on beach use ad found that WTGs of approximately 574 ft (175 m) in height visible from greater than 15 mi (24.1 km) away would have negligible impacts on existing land uses that rely on recreation and tourism activity (Parsons and Firestone 2018). The presence of WTGs would be long-term and have negligible to minor impacts on land use and coastal infrastructure.

3.18.5.3 Conceptual Decommissioning

3.18.5.3.1 Onshore Activities and Facilities

Conceptual decommissioning of the Proposed Action would have similar, negligible to moderate adverse and minor beneficial impacts to land use and coastal infrastructure as described under construction activities. BMPs would be implemented to limit adverse impacts from noise, lighting, traffic, and land disturbance, and major onshore construction activities would occur outside of the busy recreation and tourism summer season.

3.18.5.3.2 Offshore Activities and Facilities

Conceptual decommissioning of the Proposed Action would have similar, negligible to minor adverse and minor beneficial impacts to land use and coastal infrastructure as described under construction activities. BMPs would be implemented to limit adverse impacts from noise, lighting, traffic, and land disturbance.

3.18.5.4 Cumulative Impacts of the Proposed Action

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned offshore wind activities.

Accidental releases and discharges: The Proposed Action would contribute a noticeable increment to the cumulative accidental release impacts on land use and costal infrastructure. There is an increased risk of accidental releases of fuel/fluids/hazardous materials in the GAA that would result in increased impacts that are short-term, and negligible to minor on land use and coastal infrastructure.

Land Disturbance: The Proposed Action would result in localized, short-term, minor to moderate impacts to land use and coastal infrastructure due to construction-related disturbance and access limitations at the landfall site and along the onshore transmission cable route. The impacts expected from the Proposed Action would only be additive if land disturbance with one or more other projects occurs in close spatial and temporal proximity, as the anticipated impacts are short-term and localized. The cumulative impacts of the Proposed Action would be negligible to moderate.

Lighting: The Proposed Action would contribute a noticeable increment to the cumulative impacts from WTGs and construction activities to lighting. Offshore WTG lighting would result in continuous, long-term, negligible to minor impacts to land use and coastal infrastructure, whereas impacts from

construction activities would be short-term and localized. Section 3.22, *Scenic and Visual Resources* describes that offshore nighttime construction lighting and operational aviation hazard lighting for the potential 1,073 WTGs in the visual GAA associated with the Proposed Action and other offshore wind projects could be visible from some shorelines. The visibility of the lighting would be dependent upon the distance of the viewer, the atmospheric conditions, vegetation, topography, and weather. The impacts from the Proposed Action to land use and coastal infrastructure in context of planned activities would be similar, but more significant than, the impacts associated with just the Proposed Action. The cumulative impacts of lighting from the Proposed Action would be continuous, long-term, and negligible to minor.

Noise: The Proposed Action would contribute a noticeable increment to the cumulative impacts on land use and coastal infrastructure, which would result in localized, short-term, minor to moderate impacts. Impacts on land use and coastal infrastructure from noise would only be additive if construction activities associated with one or more projects occurs in close spatial and temporal proximity.

Port Utilization: Offshore wind development, including the Proposed Action, would require port facilities for construction activities and ports for daily activity at an O&M facility. This would support ongoing or new activities at ports that would reinforce the designated land use of the port, support jobs, and would provide a source of investment to coastal infrastructure. The cumulative impacts from the Proposed Action of port utilization would have minor, beneficial impacts to land use and coastal infrastructure.

Presence of Structures: The Proposed Action would contribute a noticeable increment to the cumulative onshore transmission cable infrastructure and the presence of structures on land use and coastal infrastructure. The Proposed Action's substation is located in areas designated for industrial uses and would co-locate the onshore transmission cable with existing roads and other utility ROWs. If other Projects were also located in areas designated for utility or industrial uses and cables were located in existing ROWs or roads, then it would not be anticipated that there would be conflicts with established and planned land uses or coastal infrastructure in local areas. These impacts are expected to be minor adverse.

Traffic: Localized, short-term and moderate cumulative impacts on land use and coastal infrastructure due to lane closures, shifted traffic patterns, closed roadways, or limits in parking are anticipated. Impacts on land use and coastal infrastructure from traffic would only be additive if traffic associated with one or more projects occurs in close spatial and temporal proximity. Impacts would be negligible to minor on land use and coastal infrastructure.

3.18.5.5 Conclusions

Impacts of the Proposed Action

BOEM anticipates that overall impacts on land use and coastal infrastructure from the Proposed Action would be **moderate** adverse with **minor beneficial** impacts. The Proposed Action would have moderate adverse impacts resulting from traffic, land disturbance, and noise from onshore construction activities. The Proposed Action would have minor adverse impacts resulting from accidental releases and discharge, the construction of onshore facilities, and the presence of WTGs. The Proposed Action would have negligible adverse impacts to lighting, offshore construction noise, and increased port utilization.

The Proposed Action would have minor beneficial impacts to port utilization by supporting designated activities that already occur at existing ports. The overall adverse impacts to land use and coastal infrastructure would be short-term, localized, and small, with beneficial impacts resulting from port utilization.

Cumulative Impacts of the Proposed Action

In the context of other reasonably foreseeable environmental trends in the area, the overall cumulative impacts resulting from individual IPFs would be **moderate** with **minor beneficial** impacts. Considering all the IPFs together, BOEM anticipates that the contribution of the Proposed Action to the impacts associated with ongoing and planned activities would result in **moderate** adverse impacts and **minor beneficial** impacts on land use and coastal infrastructure in the GAA.

3.18.6 Alternative C-1 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

3.18.6.1 Construction and Installation

3.18.6.1.1 Onshore Activities and Facilities

The impacts of Alternative C-1 on construction and installation would be similar to the Proposed Action for onshore activities and facilities.

3.18.6.1.2 Offshore Activities and Facilities

The impacts of Alternative C-1 on construction and installation would be similar to the Proposed Action for offshore activities and facilities.

3.18.6.2 Operations and Maintenance

3.18.6.2.1 Onshore Activities and Facilities

The impacts of Alternative C-1 on O&M would be similar to the Proposed Action for onshore activities and facilities.

3.18.6.2.2 Offshore Activities and Facilities

The impacts of Alternative C-1 on O&M would be similar to the Proposed Action for offshore activities and facilities.

3.18.6.3 Conceptual Decommissioning

3.18.6.3.1 Onshore Activities and Facilities

The impacts of Alternative C-1 on the conceptual decommissioning would be similar to the Proposed Action for onshore activities and facilities.

3.18.6.3.2 Offshore Activities and Facilities

The impacts of Alternative C-1 on the conceptual decommissioning would be similar to the Proposed Action for offshore activities and facilities.

3.18.6.4 Cumulative Impacts of Alternative C-1

The cumulative impacts on land use and coastal would range from negligible to moderate adverse to minor beneficial impacts. In the context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-1 to the cumulative impacts on land use and coastal infrastructure would be similar to those described under the Proposed Action.

3.18.6.5 Conclusions

Impacts of Alternative C-1

Under Alternative C-1, the potential impacts to land use and coastal infrastructure are anticipated to be the same as described under the Proposed Action under Construction and Installation, Operation and Maintenance, and Conceptual Decommissioning actions. Under this alternative, the construction of onshore facilities would remain the same, and changes in construction to offshore facilities would not result in significantly different impacts than under the Proposed Action. There is the potential for differences in the visual impacts from the lighting and location of WTGs in the offshore area; however, these differences would not result in changes to land use and coastal infrastructure impacts. As a result, BOEM expects that the overall impacts from Alternative C-1 to land use and coastal infrastructure would be similar to the Proposed Action, **moderate** adverse with **minor beneficial** impacts.

Cumulative Impacts of Alternative C-1

In context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to the cumulative impacts resulting from individual IPFs associated with ongoing and planned activities would be the same as that of the Proposed Action. Impacts are expected to result in **moderate** adverse impacts for onshore land use and coastal infrastructure and **minor beneficial** impacts. The overall impacts of Alternative C-1 combined with ongoing and planned activities on land use would be very similar to those of the Proposed Action. These impacts would primarily stem from installation of onshore infrastructure and port utilization, which would be the same for all of the alternatives considered.

3.18.7 Alternative C-2 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

Alternative C-2 was developed to potentially reduce impacts to fisheries habitat within the Lease Area by removing up to 8 WTGs from Priority Areas 1, 2, 3, and/or 4 and relocating up to an additional 12 WTGs to currently unoccupied positions along the eastern side of the Lease Area. Under Alternative C-2, the 11-MW WTGs and OCS-DC would occur within the range of design parameters outlined in the COP.

3.18.7.1 Construction and Installation

3.18.7.1.1 Onshore Activities and Facilities

The impacts of Alternative C-2 on construction and installation would be similar to the Proposed Action for onshore activities and facilities.

3.18.7.1.2 Offshore Activities and Facilities

The impacts of Alternative C-2 on construction and installation would be similar to the Proposed Action for offshore activities and facilities.

3.18.7.2 Operations and Maintenance

3.18.7.2.1 Onshore Activities and Facilities

The impacts of Alternative C-2 on O&M would be similar to the Proposed Action for onshore activities and facilities.

3.18.7.2.2 Offshore Activities and Facilities

The impacts of Alternative C-2 on O&M would be similar to the Proposed Action for offshore activities and facilities.

3.18.7.3 Conceptual Decommissioning

3.18.7.3.1 Onshore Activities and Facilities

The impacts of Alternative C-2 on decommissioning would be similar to the Proposed Action for onshore activities and facilities.

3.18.7.3.2 Offshore Activities and Facilities

The impacts of Alternative C-2 on decommissioning would be similar to the Proposed Action for offshore activities and facilities.

3.18.7.4 Cumulative Impacts of Alternative C-2

The cumulative impacts on land use and coastal would range from negligible to moderate adverse to minor beneficial impacts. In the context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-2 to the cumulative impacts on land use and coastal infrastructure would be similar to those described under the Proposed Action.

3.18.7.5 Conclusions

Impacts of Alternative C-2

Under Alternative C-2, the potential impacts to land use and coastal infrastructure are anticipated to be the same as described under the Proposed Action under Construction and Installation, Operation and Maintenance, and Conceptual Decommissioning actions. Under this alternative, the construction of onshore facilities would remain the same, and changes in construction to offshore facilities would not result in significantly different impacts than under the Proposed Action. There is the potential for differences in the visual impacts from the lighting and location of WTGs in the offshore area; however, these differences would not result in changes to land use and coastal infrastructure impacts. As a result, BOEM expects that the overall impacts from Alternative C-2 to land use and coastal infrastructure would be similar to the Proposed Action, and impacts would be **moderate** adverse with **minor beneficial** impacts.

Cumulative Impacts of Alternative C-2

In context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to the impacts resulting from individual IPFs associated with ongoing and planned activities would be the same as that of the Proposed Action. Impacts are expected to result in **moderate** adverse impacts for onshore land use and infrastructure with **minor beneficial** impacts. The overall impacts of Alternative C-2 combined with ongoing and planned activities on land use would be very similar to those of the Proposed Action. These impacts would primarily stem from installation of onshore infrastructure and port utilization, which would be the same for all of the alternatives considered.

3.18.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.18.8.1 Construction and Installation

3.18.8.1.1 Onshore Activities and Facilities

The impacts of Alternative C-3a, C-3b, and C-3c on construction and installation would be similar to the Proposed Action for onshore activities and facilities.

3.18.8.1.2 Offshore Activities and Facilities

The impacts of Alternative C-3a, C-3b, and C-3c on construction and installation would be similar to the Proposed Action for offshore activities and facilities.

3.18.8.2 Operations and Maintenance

3.18.8.2.1 Onshore Activities and Facilities

The impacts of Alternative C-3a, C-3b, and C-3c on O&M would be similar to the Proposed Action for onshore activities and facilities.

3.18.8.2.2 Offshore Activities and Facilities

The impacts of Alternative C-3a, C-3b, and C-3c on O&M would be similar to the Proposed Action for offshore activities and facilities.

3.18.8.3 Conceptual Decommissioning

3.18.8.3.1 Onshore Activities and Facilities

The impacts of Alternative C-3a, C-3b, and C-3c on decommissioning would be similar to the Proposed Action for onshore activities and facilities.

3.18.8.3.2 Offshore Activities and Facilities

The impacts of Alternative C-3a, C-3b, and C-3c on decommissioning would be similar to the Proposed Action for offshore activities and facilities.

3.18.8.4 Cumulative Impacts of Alternative C-3

The cumulative impacts on land use and coastal would range from **negligible** to **moderate** adverse to **minor beneficial** impacts. In the context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-3 to the cumulative impacts on land use and coastal infrastructure would be similar to those described under the Proposed Action.

3.18.8.5 Conclusions

Impacts of Alternative C-3

Under Alternative C-3a, C-3b, and C-3c, the potential impacts to land use and coastal infrastructure are anticipated to be the same as described under the Proposed Action under Construction and Installation, Operation and Maintenance, and Conceptual Decommissioning actions. Under this alternative, the construction of onshore facilities would remain the same, and changes in construction to offshore facilities would not result in significantly different impacts than under the Proposed Action. There is the potential for differences in the visual impacts from the lighting and location of WTGs in the offshore

area; however, these differences would not result in changes to land use and coastal infrastructure impacts. As a result, BOEM expects that the overall impacts from Alternative C-3a, C-3b, and C-3c to land use and coastal infrastructure would be similar to the Proposed Action, and impacts would be **moderate** adverse with **minor beneficial** impacts.

Cumulative Impacts of Alternative C-3

In context of reasonably foreseeable environmental trends, the contribution of Alternative C-3a, C-3b, and C-3c to the impacts resulting from individual IPFs associated with ongoing and planned activities would be the same as that of the Proposed Action. Cumulative impacts are expected to result in **moderate** adverse impacts for onshore land use and infrastructure with **minor beneficial** impacts. The overall impacts of Alternative C-3a, C-3b, and C-3c combined with ongoing and planned activities on land use would be very similar to those of the Proposed Action. These impacts would primarily stem from installation of onshore infrastructure and port utilization, which would be the same for all of the alternatives considered.

3.18.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall negligible to moderate adverse impacts and minor beneficial impacts on land use and coastal infrastructure. Table 3.18-2 provides an overall summary of alternative impacts.

Table 3.18-2. Comparison of Impacts on Land Use and Coastal Infrastructure

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: BOEM anticipates that impacts on land use and coastal infrastructure from the No Action Alternative would be **minor** adverse impacts with **minor beneficial** impacts. *Cumulative Impacts of the No Action Alternative:* In context of reasonably foreseeable environmental trends, BOEM anticipates that the cumulative impacts resulting from all of the IPFs together result in **minor** adverse impacts for onshore land use and coastal infrastructure and **minor beneficial** impacts.	*Proposed Action:* BOEM anticipates that impacts on land use and coastal infrastructure from the Proposed Action would be **moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of the Proposed Action:* Considering all the IPFs together, BOEM anticipates that the contribution of the Proposed Action to the impacts associated with ongoing and planned activities would result in **moderate** adverse impacts and **minor beneficial** cumulative impacts on land use and coastal infrastructure in the GAA.	*Alternative C-1:* BOEM expects that the impacts from Alternative C-1 to land use and coastal infrastructure would be similar to the Proposed Action, and impacts would be **moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of Alternative C-1:* In context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to the cumulative impacts resulting from individual IPFs associated with ongoing and planned activities would be the same as that of the Proposed Action. Cumulative impacts are expected to result in **moderate** adverse impacts for onshore land use	*Alternative C-2*: BOEM expects that the impacts from Alternative C-2 to land use and coastal infrastructure would be similar to the Proposed Action, and impacts would be **moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of Alternative C-2:* In context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to the impacts resulting from individual IPFs associated with ongoing and planned activities would be the same as that of the Proposed Action. Cumulative impacts are expected to result in **moderate** adverse impacts for onshore land use and infrastructure and **minor beneficial** impacts.	*Alternative C-3:* BOEM expects that the impacts from Alternative C-3 to land use and coastal infrastructure would be similar to the Proposed Action, and impacts would be **moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of Alternative C-3:* In context of reasonably foreseeable environmental trends, the contribution of Alternative C-3 to the impacts resulting from individual IPFs associated with ongoing and planned activities would be the same as that of the Proposed Action. Cumulative impacts are expected to result in **moderate** adverse impacts for onshore land use

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
		and coastal infrastructure and **minor beneficial** impacts.		and coastal infrastructure and **minor beneficial** impacts.

3.18.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Under Alternative C-3b, overall impacts on land use and coastal infrastructure would be similar to the Proposed Action, **moderate** adverse with **minor beneficial** impacts for the Preferred Alternative.

3.18.11 Proposed Mitigation Measures

No additional measures to mitigate impacts on land use and coastal infrastructure have been proposed for analysis.

3.18.11.1 Effect of Measures Incorporated into the Preferred Alternative

Since no mitigation measures have been proposed, impact levels for the Preferred Alternative would remain as described above in Section 3.18.8.

3.19 Navigation and Vessel Traffic

This section discusses potential impacts on navigation and vessel traffic from the proposed Project, alternatives, and future offshore wind activities in the GAA (Appendix D, Figure D-16). The navigation and vessel traffic GAA as described in Appendix D, includes a 10-mile buffer around SRWF and neighboring wind farms, as well as port facilities and neighboring fairways and recommended vessel routes.

In 2019, the USCG conducted the Massachusetts and Rhode Island Port Access Route Study to determine what, if any, navigational safety concerns exist with vessel transits in the study area, and to evaluate the need for establishing vessel routing measures for projects in the Rhode Island/Massachusetts WEA (USCG 2020). The study recommended that the turbine layout be developed along a standard and uniform grid pattern with at least three lines of orientation and standard 1-nm spacing to accommodate vessel transits, fishing operations, and search and rescue operations (USCG 2020). The USCG further concluded that adoption of a standard and uniform grid pattern would likely eliminate the need for formal or informal routing measures (USCG 2020). In 2019, all leases in the Rhode Island and Massachusetts WEAs proposed a uniform and aligned 1-nm x 1-nm structure layout (Navigation Risk and Safety Assessment [NRSA]) (DNV-GL 2020).

Sunrise Wind included a NRSA (DNV-GL 2020) as part of the Sunrise Wind COP in accordance with USCG Navigation and Vessel Inspection Circular (NVIC 01-19). The NSRA used traffic data (including AIS and VMS data), operational data, and environmental data to evaluate the impact of the proposed SRWF on navigation.

DNV-GL utilized AIS data from July 1, 2018, to June 30, 2019, and the Marine Accident Risk Calculation System (MARCS) model to calculate incident frequency within the SRWF Project Area. MARCS was developed by DNV-GL in the mid-1990s and combines a risk model with calculation tools that estimate the frequency of navigation hazards, including collision, grounding, and allision as outlined by the NVIC 01-19. MARCS calculates the frequency at which critical situations are produced. In the context of navigation risk, critical situations may result in an incident: defined as collision, allision, or grounding. A vessel colliding with another vessel is defined as a collision. A vessel colliding with a stationary object is an allision. A craft contacting the seabed is known as grounding (COP, Section 4.8.1; Sunrise Wind 2023).

3.19.1 Description of the Affected Environment and Future Baseline Conditions

Existing marine traffic and navigation in the region, including the SRWF, were outlined in Appendix X *Navigational Safety Risk Assessment* of the COP (DNV-GL 2022). This assessment details the variety of vessels using the Lease Area and the surrounding waters. Commercial, military, and recreational vessels comprise the major types of vessels transiting these waters. Recreational vessels are seasonally active, compared to the year-round transit of commercial and military vessels (COP, Section 4.8.1; Sunrise Wind 2023). Summer traffic in the region can increase as much as four times the winter traffic due to this increase in recreational and pleasure watercraft (USCG 2020).

The majority of vessel traffic within the SRWF is pleasure, fishing, and other/undefined (COP, Section 4.8.1; Sunrise Wind 2023). Other/undefined AIS data may be the result of improper equipment

registration or the system using it as a default value, but these records were not found to deviate from patterns of defined vessels (USCG 2020). Fishing vessels and cargo and tanker vessels in the Lease Area transited mostly on repeat routes by type, whereas pleasure, recreation, and other/undefined vessels were much less common and did not follow a typical transit pattern when they did pass through the Lease Area. Cargo and tanker vessels are infrequent in their travel through the Lease Area, even though they are the most regular in their transits; AIS data show north-south and east-west cargo and tanker ship travel through the Lease Area (COP, Section 4.8.1; Sunrise Wind 2023). AIS data confirm that fewer than one tanker and one cargo vessel per day transit the Lease Area. Tugs and service vessels similarly displayed very few crossings into the Lease Area, maintaining coastwise transit patterns (COP, Section 4.8.1; Sunrise Wind 2023).

Future baseline conditions are hard to predict. One of the only indicators of future vessel traffic is proposed port development activities because the region has a lack of proper infrastructure with sufficient water depths for larger vessels (USCG 2020). Current or projected dredging projects in the immediate vicinity would not be expected to impact vessel traffic or density because they are to maintain currently authorized depths and there are no permitted bridge projects with the intention to increase air draft (USCG 2020). While the ports of New York and New Jersey and Boston Harbor are deepening to accommodate post-Panamax vessels, the data suggest that vessel traffic within the MR/RI WEA is expected to remain relatively stable into the foreseeable future (BOEM 2019). However, the ports of New Bedford, Fairhaven, Davisville, and Brayton Point have been upgraded to support offshore wind activities, from construction through O&M and decommissioning (USCG 2020). An increase is expected at the Port of Providence in the number of liquified petroleum gas vessels that transit through the WEA, up to eight annually, while the Port of Newport anticipates the current rate of 40 to 50 cruise ships to double (USCG 2020). During wind farm development activities, the USCG (2020) anticipates that there may be a slight increase in certain vessels and traffic characteristics, which should be met with an equal increase in vessels and traffic conditions during decommissioning. The USCG (2020) anticipates the number of recreational vessels, excursion vessels, and fishing vessels to increase post-construction. The Project assumes that large vessels would navigate around the wind farm (COP, Section 4.8.1; Sunrise Wind 2023).

3.19.2 Impact Level Definitions for Navigation and Vessel Traffic

This Final EIS uses a four-level classification scheme to analyze potential impact levels to navigation and vessel traffic from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.19-1 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for navigation and vessel traffic. Table G-18 in Appendix G identifies potential IPFs, issues, and indicators to assess impacts to navigation and vessel traffic.

Table 3.19-1. Definitions of Potential Beneficial and Adverse Impact Levels for Navigation and Vessel Traffic

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	No measurable impacts would occur	Either no effect or no measurable impacts
Minor	Impacts to vessels and turbines could be avoided with environmental protection measures (EPMs). Impacts would not disrupt the normal or routine functions or navigation of the vessel or turbine.	N/A
Moderate	Impacts are unavoidable, although EPMs would reduce impacts substantially during the life of the Project. The vessel would have to adjust somewhat to account for disruptions due to impacts of the Project	N/A
Major	Vessel traffic would experience unavoidable disruptions to a degree beyond what is normally acceptable.	N/A

3.19.3 Impacts of Alternative A – No Action on Navigation and Vessel Traffic

When analyzing the impacts of the No Action Alternative on navigation, BOEM considered the impacts of ongoing activities, including ongoing non-offshore wind and ongoing offshore wind activities on the baseline conditions for navigation. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

The description of Section 3.19.3, *Affected Environment and Future Baseline Conditions,* provides an overview of information on past and present activities related to navigation and vessel traffic. Future non-Project actions include offshore wind energy development, undersea transmission lines, gas pipelines, other submarine cables, tidal energy projects, marine minerals use and ocean-dredged material disposal, military uses, marine transportation, fisheries use and management, global climate change, oil and gas activities, and onshore development activities which are discussed in further detail in Appendix E. Impacts associated with future offshore wind activities in relation to navigation and vessel traffic are described in the following text.

3.19.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for navigation and vessel traffic would continue to follow regional current trends and respond to IPFs introduced by other ongoing and planned activities. Ongoing activities within the GAA that contribute to impacts on navigation and vessel traffic are generally associated with marine transportation, military use, NMFS activities and scientific research, fisheries use and management, and existing and permitted/in construction offshore wind farms. Impacts

from these activities increase vessel traffic in the area, adding to congestion in waterways and increasing the potential for maritime accidents. Impacts associated with global climate change have the potential to require modifications to existing port infrastructure and Aids to Navigation, with the former adding to port congestion and limited berths during construction activities.

Ongoing offshore wind activities within the GAA that contribute to impacts on navigation include:

- Continued O&M of the Block Island Project (5 WTGs) installed in state waters;
- Continued O&M of the CVOW project (2 WTGs) installed in OCS-A 0497; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of the Block Island and CVOW projects and ongoing construction of the Vineyard Wind 1 and South Forks projects would affect navigation through the primary IPFs of anchoring, cable emplacement and maintenance, presence of structures, port utilization, and traffic. Ongoing offshore wind activities would have the same type of impacts from anchoring, cable emplacement and maintenance, presence of structures, port utilization, and traffic that are described in the following section for planned offshore wind activities.

3.19.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Planned non-offshore wind activities that may affect navigation and vessel traffic in the GAA include port improvement projects, dredging projects, and installation of new structures on the OCS (refer to Appendix E for a description of ongoing and planned activities). These activities may result in a moderate increase in port maintenance activities, port upgrades to accommodate larger deep-draft vessels, and short-term increases in vessel traffic for offshore cable emplacement and maintenance. Appendix E provides a summary of potential impacts associated with ongoing and planned non-offshore wind activities by IPF for navigation and vessel traffic.

Including the SRWF, a total of three other wind farms are proposed for Rhode Island/Massachusetts WEA with others in planning and construction phases. These future activities are expected to affect navigation and vessel traffic through the following primary IPFs.

Anchoring: Future offshore wind developers are expected to coordinate with the maritime community and USCG to avoid laying export cables through any traditional or designated lightering/anchorage areas, meaning that any risk for deep-draft vessels would come from anchoring in an emergency scenario, specifically near the Narragansett Bay and Buzzards Bay traffic separation schemes (Table 3.19-2). Larger vessels accidentally dropping anchor on an export cable (buried or mattress protected) to prevent drifting in the event of vessel power failure would result in damage to the export cable, risks to the vessel associated with an anchor contacting an electrified cable, and impacts to the vessel operator's

liability and insurance. Impacts on navigation and vessel traffic would be short-term and localized, and navigation and vessel traffic would fully recover following the disturbance.

Cable emplacement and maintenance: Under the No Action Alternative, every other project within the Rhode Island/Massachusetts WEA is expected to plan a unique cable route. Cable emplacement would have short-term, localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions.

Presence of structures: The placement of structures would have long-term adverse impacts on vessel traffic in the Rhode Island/Massachusetts WEA. Ocean renewable infrastructure would likely displace large vessels. In 2016, USCG concluded that creating routing measures where structures currently do not exist would more than likely result in an increase in risk due to vessels navigating in closer proximity to each other than they would otherwise in an open ocean scenario (USCG 2016). While large vessels are expected to navigate around the Rhode Island/Massachusetts WEA, this would increase journey time and voyage cost.

BOEM assumes that all offshore wind developments would utilize the joint lessee proposed structure layout, to be developed along a standard and uniform grid pattern with at least three lines of orientation and standard 1-nm (1.9-km) spacing. Because this layout supports the traditional east-west active fishing operations, traditional northwest to southeast transit patterns, and allows for dispersal of small vessel traffic, this arrangement would reduce, but not eliminate, navigational complexity and economic displacement during the operational phase of the project.

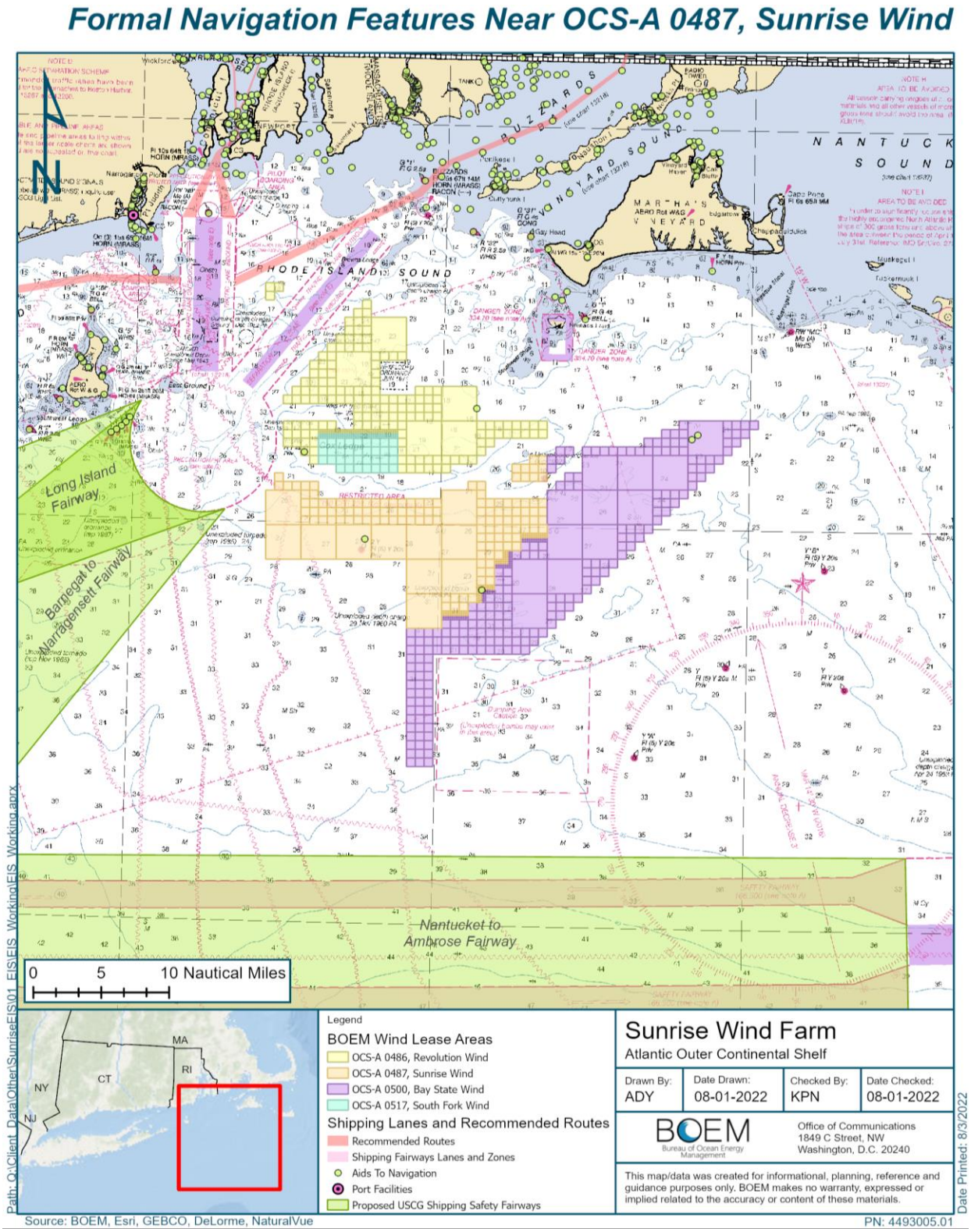

Figure 3.19-1. Current and Proposed Offshore Wind Farms within the Rhode Island / Massachusetts WEA with Convex Hull which Represents the Shortest Path around the Navigational Obstruction

Marine vessel radars are not optimized to operate in the Rhode Island/Massachusetts WEA, because the nominal WTG structure has a large radar cross-section (RCS) leading to many strong reflected signals entering the radar receiver, which is further complicated by multipath and other ambiguous returns (National Academies of Sciences, Engineering, and Medicine 2022). BOEM expects the industry to adopt both technological and non-technology-based measures to reduce impacts on marine radar, including greater use of AIS and electronic charting systems, new technologies like light detection and radar (LIDAR), employing more watchstanders[3], and simply avoiding wind farms altogether (National Academies of Sciences, Engineering, and Medicine 2022).

Port utilization: The USCG indicates that the ports of New Bedford, Fairhaven, Davisville, and Brayton Point have been upgraded to support offshore wind activities associated with the Rhode Island/Massachusetts WEA, while the ports of Bridgeport, New London, Port Jefferson, and New York have announced upgrade projects to support the wind energy industry (USCG 2020). It is expected that vessel congestion would increase in the short-term, during construction and again during decommissioning. However, it is unlikely significant enough to impact safe navigation through wind farms (USCG 2020). Construction port facilities are expected to serve multiple offshore wind projects, and potentially multiple offshore wind related and other maritime industries. Specifically, the COP indicates the following are primary construction ports, Albany and/or Coeymans, New York (foundation), New London, Connecticut (staging and preassembly), and the Port of Davisville-Quonset Point, Rhode Island (construction management base) (COP, Section 3.3.10; Sunrise Wind 2023). Back-up options include the Port of New York-New Jersey, New York, the New Bedford Marine Commerce Terminal, Massachusetts, Sparrow's Point, Maryland, Paulsboro Marine Terminal, New Jersey, Port of Providence, Rhode Island and Port of Norfolk, Virginia (COP, Section 3.3.10; Sunrise Wind 2023).

Traffic: Construction and decommissioning activities associated with adjacent wind farms would result in an increase of vessel traffic near those areas. Additional impacts would include delays within or approaching ports; increased navigational complexity; detours to offshore travel or port approaches; or increased risk of incidents such as collision, strikes or allisions, and groundings. Other reasonably foreseeable future offshore projects would produce additional vessel traffic during construction, but because of their timing, they are not anticipated to use the same traffic routes. Construction of other offshore wind projects would be scheduled to minimize overlapping construction periods and reduce the number of construction vessels in operation at any given time, effectively reducing the cumulative impact on port congestion and construction vessel rerouting.

3.19.3.3 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and conceptual decommissioning would not occur at any proposed project; and potential impacts on navigation and vessel traffic associated with the Project would not occur. However, ongoing and future activities would have continued short-term to long-term impacts on navigation,

[3] Watchstander--a person on watch on a ship.

primarily through existing traffic activity, port use, and the presence of structures. Continuation of existing environmental trends and activities under the No Action Alternative would result in **moderate** adverse impacts on navigation and vessel traffic.

Cumulative Impacts of the No Action Alternative

BOEM anticipates that the cumulative impacts for reasonably foreseeable offshore wind activities, especially the presence of structures, port utilization, and vessel traffic, would be **moderate** adverse. Future offshore wind projects, once approved, would increase vessel activity, which could lead to congestion at affected ports, the possible need for port upgrades beyond those currently envisioned, as well as an increased likelihood of collisions and allisions, with resultant increased risk of accidental releases. In addition, the presence of new WTGs would increase the risk for collisions, allisions, and resultant accidental releases and threats to human health and safety.

Considering all the IPFs together, BOEM anticipates that the impacts associated with future offshore wind activities in the GAA combined with ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable activities other than offshore wind would result in **moderate** adverse impacts because the overall effect would be notable, but vessels could adjust to account for disruptions and EPMs would reduce impacts.

3.19.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the COP, Section 4.8.1 (Sunrise Wind 2023), would result in impacts similar to or less than the described actions listed below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on navigation and vessel traffic characteristics:

- The Project layout including the number, type, and placement of the WTGs and OCS-DC including the location, width, and orientation of the SRWF rows and columns;
- The number of vessels utilized for construction, installation, and decommissioning;
- The SRWEC corridor route;
- Time of year of construction;
- Ports selected to support construction, installation, and decommissioning;
- Ports selected to perform O&M; and
- Variances in any of these factors could affect navigation vessel traffic and navigation routes. Since this section assessed the maximum-case scenario, variances are expected to lead to similar or even reduced impacts.

3.19.5 Impacts of Alternative B – Proposed Action on Navigation and Vessel Traffic

BOEM expects the Proposed Action to impact navigation and vessel traffic during construction and installation, O&M, and decommissioning activities.

3.19.5.1 Construction and Installation

During the construction and installation phase of the Project, the Proposed Action is anticipated to affect navigation and vessel traffic. The Project would plan vessel routes for all vessel types in accordance with industry guidelines and best practices as defined by the International Chamber of Shipping (COP, Section 4.8.1; Sunrise Wind 2023). All vessels associated with the construction of the SRWF would be equipped with AIS to monitor compliance with speed requirements (COP, Section 4.8.1; Sunrise Wind 2023). All offshore work would halt during unsafe wind conditions, lightning storms, and/or sea states that exceed Project operational limits (COP, Section 4.8.1; Sunrise Wind 2023). Sunrise Wind would implement a communication plan during the construction phase to inform mariners of construction-related activities, which would be facilitated through the maintenance of a Project website, liaison with fisheries, notice to mariners and vessel float plans, and in coordination with the USCG (COP, Section 4.8.1; Sunrise Wind 2023).

3.19.5.1.1 Onshore Activities and Facilities

Construction and installation associated with onshore facilities would not be expected to impact navigation and vessel traffic.

3.19.5.1.2 Offshore Activities and Facilities

Planned offshore construction and installation activities associated with the SRWF would significantly impact navigation and vessel traffic. Project effects include increased vessel traffic near the SRWF and OCS-DC, and ports used by the Project; obstructions to navigation; delays within or approaching ports; increased navigational complexity; changes to navigation patterns; detours to offshore travel or port approaches; or increased risk of incidents such as collision, allision, and groundings. The Project may request that the USCG establish temporary safety zones around each WTG, and the OCS-DC (COP, Section 4.8.1; Sunrise Wind 2023). However, mariners must always abide by Convention on the International Regulations for Preventing Collisions at Sea.

The expected timeline to construct and install offshore facilities would span from second quarter 2024 to the end of the fourth quarter 2025 (COP, Section 4.8.1; Sunrise Wind 2023). During that timeline, up to 94 11-MW WTGs, inter-array cabling, and an OCS-DC would be constructed, and 106 miles of export cable would be laid (COP, Section 4.8.1; Sunrise Wind 2023).

Anchoring: SRWF is expected to coordinate with the maritime community and USCG to avoid laying export cables through any traditional or designated lightering/anchorage areas, meaning that any risk for deep-draft vessels would come from anchoring in an emergency scenario. The cable and other Project features would be appropriately plotted on nautical charts as well. Generally, larger vessels accidentally dropping anchor on top of an export cable (buried or mattress protected) to prevent drifting in the event of vessel power failure would result in damage to the export cable, risks to the vessel associated with an anchor contacting an electrified cable, and impacts to the vessel operator's liability and insurance. Cables would typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m). However, the target burial depth in specific areas along the cable routes would be determined based on an assessment of seafloor conditions, seabed mobility, and the risk of interaction with external hazards such as fishing gear and

vessel anchors: which would be determined through a Cable Burial Risk Assessment (CBRA) if the COP is approved. Impacts on navigation and vessel traffic would be short-term and localized, and navigation and vessel traffic would fully recover following the disturbance.

Cable emplacement and maintenance: Cable emplacement would have short-term, localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions. The SRWEC would be installed within a survey corridor ranging in width from 1,312 ft to 2,625 ft (400 m to 800 m) depending on water depth, buried to a target depth of 4 ft to 6 ft (1.2 mi to 1.8 m), and supported by 31 different vessels during construction (COP, Section 3.3.4; Sunrise Wind 2023). A cable-laying vessel would move along the pre-determined route from landfall towards the SRWF (COP, Section 3.3.3.4; Sunrise Wind 2023). BOEM expects that Sunrise Wind would implement a communication plan during the cable emplacement and maintenance, which would be facilitated through the maintenance of a Project website, liaison with fisheries, notice to mariners and vessel float plans, and in coordination with the USCG (COP, Section 4.8.1; Sunrise Wind 2023). Additionally, the USCG requests timely access to construction plans, such as Facility Design Reports and/or Fabrication Installation Reports for the purpose of identifying activities impacting Navigation and Vessel Traffic and USCG missions on the Marine Transportation System, especially Cable Burial Plans and their associated risk and feasibility assessments. Early access to these documents may prevent conflicts with planned activities.

Presence of structures: The placement of structures would have long-term adverse impacts on vessel traffic in the Rhode Island/Massachusetts WEA. Ocean renewable infrastructure would likely displace large vessels. In 2016, USCG concluded that creating routing measures where structures currently do not exist would more than likely result in an increase in risk due to vessels navigating in closer proximity to each other than they would otherwise in an open ocean scenario (USCG 2016). While large vessels are expected to navigate around the Rhode Island/Massachusetts WEA, this would increase journey time and voyage cost.

BOEM assumes that all offshore wind developments would utilize the joint lessee proposed structure layout, to be developed along a standard and uniform grid pattern with at least three lines of orientation and standard 1-nm (1.9-km) spacing. As the proposed layout for SRWF is aligned with the joint proposed layout, and because this layout supports the traditional east-west active fishing operations, traditional northwest to southeast transit patterns, and allows for dispersal of small vessel traffic, this arrangement would reduce, but not eliminate, navigational complexity and economic displacement during the operational phase of the Project.

Marine vessel radars are not optimized to operate in the Rhode Island/Massachusetts WEA, because the nominal WTG structure has a large RCS leading to many strong reflected signals entering the radar receiver, which is further complicated by multipath and other ambiguous returns (National Academies of Sciences, Engineering, and Medicine 2022). BOEM expects the industry to adopt both technological and non-technology-based measures to reduce impacts on marine radar, including greater use of AIS and electronic charting systems, new technologies like LIDAR, employing more watchstanders, and simply avoiding wind farms altogether (National Academies of Sciences, Engineering, and Medicine 2022).

Port utilization: The USCG indicates that the ports of New Bedford, Fairhaven, Davisville, New London, and Brayton Point have been upgraded to support offshore wind activities associated with the Rhode Island/Massachusetts WEA, while the ports of Bridgeport, Port Jefferson, and New York have announced upgrade projects to support the wind energy industry (USCG 2020). During construction, the Project could utilize ports in seven different states for WTG component storage, pre-commissioning, foundation fabrication, staging, preassembly, and to serve as a construction base (Port of Davisville) (COP, Section 4.8.1; Sunrise Wind 2023). Specifically, the COP indicates the following are primary construction ports, Albany and/or Coeymans, New York (foundation scope), New London, Connecticut (WTG scope), and the Port of Davisville-Quonset Point, Rhode Island (construction management base) (COP, Section 3.3.10; Sunrise Wind 2023). Back-up options include the Port of New York-New Jersey, New York, the New Bedford Marine Commerce Terminal, Massachusetts, Sparrow's Point, Maryland, Paulsboro Marine Terminal, New Jersey, Port of Providence, Rhode Island and Port of Norfolk, Virginia (COP, Section 3.3.10; Sunrise Wind 2023). It is expected that vessel congestion would increase in the short-term, during construction and again during decommissioning. However, it is unlikely significant enough to impact safe navigation through wind farms and in approaching ports (USCG 2020).

Traffic: Construction and decommissioning activities associated with SRWF would result in an increase of vessel traffic near those areas and the applicable ports. Prior to WTG installation, short-term vessel traffic within the SRWF would increase during G&G surveys, surveys for MEC/UXO, and missions to clean seafloor debris. Installation of a single monopile could last from 1 to 4 hours (monopile), up to 3 monopile foundations could be installed in a 24-hour period. Installation of the single piled jacket foundation for the OCS-DC is estimated to need a maximum of 48 hours of piling driving for installation (COP, Section 3.3.5.2; Sunrise Wind 2023). At a maximum, it is expected that two vessels would be working simultaneously (i.e., two monopile vessels, or one monopile foundation vessel and one piled jacket foundation vessel) (COP, Section 3.3.52; Sunrise Wind 2023). Additional impacts would include delays within or approaching ports; increased navigational complexity; detours to offshore travel or port approaches; or increased risk of incidents such as collision, strikes or allisions, and groundings. Other reasonably foreseeable future offshore projects would produce additional vessel traffic during construction, but because of their timing, they are not anticipated to use the same traffic routes. Construction of other offshore wind projects would be scheduled to minimize overlapping construction periods and reduce the number of construction vessels in operation at any given time, effectively reducing the cumulative impact on port congestion and construction vessel rerouting.

3.19.5.2 Operations and Maintenance

A 24/7 SCADA surveillance system would operate the Project remotely, and when issues arise would sound an alarm (COP, Section 3.5; Sunrise Wind 2023). The Project's asset management system provides a data-driven assessment of the asset condition and allows for prediction and assessment of whether inspections and/or maintenance activities should be accelerated or postponed (COP, Section 3.5.1; Sunrise Wind 2023). In addition to reactive and predictive maintenance, the Project would also implement a reliability maintenance program aimed at preventing mechanical breakdowns with a potential 20 missions per year for routine service of electrical components (COP, Section 3.5.1; Sunrise Wind 2023).

3.19.5.2.1 Onshore Activities and Facilities

O&M of onshore facilities would not be expected to impact navigation and vessel traffic.

3.19.5.2.2 Offshore Activities and Facilities

Anchoring: The SRWF is expected to coordinate with the maritime community and USCG to avoid laying export cables through any traditional or designated lightering/anchorage areas, meaning that any risk for deep-draft vessels would come from anchoring in an emergency scenario. Generally, larger vessels accidentally dropping anchor on top of an export cable (buried or mattress protected) to prevent drifting in the event of vessel power failure would result in damage to the export cable, risks to the vessel associated with an anchor contacting an electrified cable, and impacts to the vessel operator's liability and insurance. Cables would typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m). However, the target burial depth in specific areas along the cable routes would be determined based on an assessment of seafloor conditions, seabed mobility, and the risk of interaction with external hazards such as fishing gear and vessel anchors: which would be determined through a Cable Burial Risk Assessment (CBRA) if the COP is approved. Impacts on navigation and vessel traffic would be short-term and localized, and navigation and vessel traffic would fully recover following the disturbance.

Cable emplacement and maintenance: Regular maintenance of the SRWEC would occur routinely and would result in an increase in vessel traffic and density. The SRWF would communicate regularly scheduled maintenance with mariners.

Presence of structures: The placement of structures would have long-term adverse impacts on vessels. Ocean renewable infrastructure would likely displace large vessels. In 2016, USCG concluded that creating routing measures where structures currently do not exist would more than likely result in an increase in risk due to vessels navigating in closer proximity to each other than they would otherwise in an open ocean scenario (USCG 2016). While large vessels would be expected to navigate around the Rhode Island/Massachusetts WEA, this would increase journey time and voyage cost.

Smaller vessels, such as fishing vessels, O&M tenders, and recreational vessels are expected to transit through the SRWF. During the O&M phase of the Project, DNV-GL predicts incident probabilities would increase in frequency by 1.6 accidents per year (COP, Section 4.8.1; Sunrise Wind 2023). Compared to a No Action Alternative baseline, the increase is accounted for by allision accidents caused by vessels striking wind structures. There are no potential grounding areas within the wind farm area.

BOEM assumes that all offshore wind developments would utilize the joint lessee proposed structure layout, to be developed along a standard and uniform grid pattern with at least three lines of orientation and standard 1-nm (1.9-km) spacing. As the proposed layout for SRWF is aligned with the joint proposed layout, and because this layout supports the traditional east-west active fishing operations, traditional northwest to southeast transit patterns, and allows for dispersal of small vessel traffic, this arrangement would reduce, but not eliminate, navigational complexity and economic displacement during the operational phase of the Project.

Finally, BOEM expects that Sunrise Wind would procure valid Private Aid to Navigation permits for each of its structures in accordance with applicable guidance, supporting navigation both within and outside of SRWF (COP, Section 4.8.1; Sunrise Wind 2023).

The WTGs and OCS-DC would be lit and marked in accordance with BOEM and USCG requirements for aviation and navigation obstruction lighting, respectively (Appendix H). They also would 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). A notional lighting plan has been included in the COP based on existing USCG regulations and policy and standards promulgated by the International Association of Marine Aids to Navigation and Lighthouse Authorities in Recommendation O-139, the Marking of Man-Made Offshore Structure (IALA 2013).

Port utilization: While not yet chosen, five potential ports have been identified for O&M activities, including the Port of Brooklyn, Port Jefferson, Port of Montauk, Port of Davisville, and the Port of Galilee. The Project expects that any ports used by O&M vessels would accommodate their needs without significant modifications or upgrades.

Traffic: O&M activities associated with SRWF and OCS-DC would result in an increase of vessel traffic near those areas and the applicable ports. Additional impacts would include increased navigational complexity; or increased risk of incidents such as collision, strikes or allisions, and groundings. Other reasonably foreseeable future offshore projects would produce additional vessel traffic during O&M that would lead to increased navigational complexity and increased risk of incidents within those projects.

3.19.5.3 Conceptual Decommissioning

Decommissioning would occur at the end of the Project's operational life according to a yet to be completed plan. The plan would follow applicable laws, regulations, and BMPs that exist at the end of the Project's operational life. It is anticipated that conceptual decommissioning would have similar adverse impacts as construction because a conceptual decommissioning would use similar number of vessels and implement the same EPMs.

3.19.5.3.1 Onshore Activities and Facilities

Onshore decommissioning activities would not be expected to impact navigation and vessel traffic.

3.19.5.3.2 Offshore Activities and Facilities

During the decommissioning phase of the Project, the Proposed Action would affect navigation and vessel traffic. The Project would plan vessel routes for all vessel types in accordance with industry guidelines and best practices as defined by the International Chamber of Shipping (COP, Section 4.8.1; Sunrise Wind 2023). All vessels associated with the decommissioning of the SRWF would be equipped with AIS technology to monitor compliance with speed requirements and ensure that all vessels operate in accordance with applicable rules and regulations for maritime operation in United States and federal waters (COP, Section 4.8.1; Sunrise Wind 2023). All offshore work would halt during unsafe wind conditions, lightning storms, and/or sea states that exceed Project operational limits (COP, Section 4.8.1;

Sunrise Wind 2023). Sunrise Wind would implement a communication plan during the decommissioning phase to inform mariners of construction-related activities, which would be facilitated through the maintenance of a Project website, liaison with fisheries, notice to mariners and vessel float plans, and in coordination with the USCG (COP, Section 4.8.1; Sunrise Wind 2023).

Anchoring: Generally, larger vessels accidentally dropping anchor on top of an export cable (buried or mattress protected) to prevent drifting in the event of vessel power failure would result in damage to the export cable, risks to the vessel associated with an anchor contacting an electrified cable, risks to decommissioning vessels attached to the cable and/or each other, and impacts to the vessel operator's liability and insurance. Impacts on navigation and vessel traffic would be short-term and localized, and navigation and vessel traffic would fully recover following the disturbance.

Cable emplacement and maintenance: Cable decommissioning would have short-term, localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions.

Presence of structures: Decommissioning is expected to impact navigation and vessel traffic at levels equivalent to the construction and commissioning phase of the Project. Presence of structures and decommissioning vessels would have significant short-term impact. Fishing and recreational vessels that once enjoyed transit through the SRWF would be temporarily restricted due to decommissioning and structure removal activities.

Port utilization: It is not yet known which ports would support decommissioning activities, however, BOEM anticipates that impacts generated during decommissioning would be equivalent to those generated during construction. It is expected that vessel congestion would increase in the short-term.

Traffic: Construction and decommissioning activities associated with SRWF would result in an increase of vessel traffic near those areas and the applicable ports. Additional impacts would include delays within or approaching ports; increased navigational complexity; detours to offshore travel or port approaches; or increased risk of incidents such as collision, strikes or allisions, and groundings. Other reasonably foreseeable future offshore projects would produce additional vessel traffic during construction, but because of their timing, they are not anticipated to use the same traffic routes. Decommissioning of other offshore wind projects would be scheduled to minimize overlapping periods and reduce the number of vessels in operation at any given time, effectively reducing the cumulative impact on port congestion and construction vessel rerouting.

3.19.5.4 Cumulative Impacts of the Proposed Action

These future activities are expected to affect navigation and vessel traffic through the following primary IPFs.

Anchoring: Future offshore wind developers are expected to coordinate with the maritime community and USCG to avoid laying export cables through any traditional or designated lightering/anchorage areas, meaning that any risk for deep-draft vessels would come from anchoring in an emergency scenario, specifically near the Narragansett Bay and Buzzards Bay traffic separation schemes (Table 3.19-2). Larger vessels accidentally dropping anchor on an export cable (buried or mattress protected) to prevent

drifting in the event of vessel power failure would result in damage to the export cable, risks to the vessel associated with an anchor contacting an electrified cable, and impacts to the vessel operator's liability and insurance. Impacts on navigation and vessel traffic would be short-term and localized, and navigation and vessel traffic would fully recover following the disturbance.

Cable emplacement and maintenance: Under the Proposed Action, SRWF and all other proposed offshore wind farms are is expected to plan a unique cable route. Cable emplacement would have short-term, localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions.

Presence of structures: The placement of structures would have long-term adverse impacts on vessel traffic in the Rhode Island/Massachusetts WEA. Ocean renewable infrastructure would likely displace large vessels while smaller vessels could still navigate through. In 2016, USCG concluded that creating routing measures where structures currently do not exist would more than likely result in an increase in risk due to vessels navigating in closer proximity to each other than they would otherwise in an open ocean scenario (USCG 2016). While large vessels are expected to navigate around the Rhode Island/Massachusetts WEA, this would increase journey time and voyage cost.

BOEM assumes that all offshore wind developments would utilize the joint lessee proposed structure layout, to be developed along a standard and uniform grid pattern with at least three lines of orientation and standard 1-nm (1.9-km) spacing. Because this layout supports the traditional east-west active fishing operations, traditional northwest to southeast transit patterns, and allows for dispersal of small vessel traffic, this arrangement would reduce, but not eliminate, navigational complexity and economic displacement during the operational phase of the project.

Marine vessel radars are not optimized to operate in the Rhode Island/Massachusetts WEA, because the nominal WTG structure has a large RCS leading to many strong reflected signals entering the radar receiver, which is further complicated by multipath and other ambiguous returns (National Academies of Sciences, Engineering, and Medicine 2022). Given the equipment commonly used on larger fishing vessels, it can be difficult to determine proximity to WTGs and smaller vessels. Marine vessel radar operating at S-band or 3GHz frequency receives disrupted signals or false readings when within close proximity to WTGs (National Academies of Sciences, Engineering, and Medicine 2022). Magnetron and non-Doppler assisted radar systems can have false readings or signals caused by the RCS of these turbines and a larger number of turbines can magnify this effect within a given area (Ghobrial 2020). These false readings or disturbances create wind turbine clutter (WTC).

WTC can cause vessels to have difficulty navigating the area to avoid stationary objects, as well as the potential to miss smaller vessels operating in closer ranges. The potential safety concerns regarding WTC are the collision of two moving objects, or allision, a moving object colliding with a stationary secondary part, such as a vessel into a WTG. The impact of WTC could be significant enough to impair the equipment utilized by USCG or Navy dispatch to properly assess and execute rescue efforts, increasing the possibility of injury or loss of life. Damages such as denting, fragmentation, cutting or any combination could collapse the tower. Fragmentation or collapse of the tower could damage submerged transmission lines, resulting in economic loss.

In combination with damages to WTGs, damage to vessels could have significant economic and societal impacts on the commercial fishing industry and recreational boating community. The main effect of wind farms on fishing navigation was loss of ground, loss of gear, and disruption to fishing effort from operation and maintenance activities (Hooper, Ashley, and Austen 2015). These impacts force fishers to fish in other areas, affecting their steaming time which could lead to change in fuel costs, decreased efficiency, extended time at sea, decrease in quality of landed fish, increased safety risks from increased time at sea (Slijkerman and Tamis 2015). In a simulation model of the Atlantic surfclam industry, BOEM found that the restrictions placed on the fishery within the SRWF are only evident in the no-fishing and no-transit cases with catch declining by 0.9 percent and time at sea increasing by 2.2 percent (Munroe et al. 2022). BOEM predicts that this would affect the profitability of the industry with revenues declining by 0.9 percent, profits declining by 2.5 percent, fuel costs increasing by 1.4 percent and processor revenues declining by 0.8 percent (Munroe et al. 2022). The same model indicated that fishers from New Bedford harbor would be impacted the greatest. Using publicly available Global Fishing Watch fishing effort data, Dunkley and Solandt (2022) found fishing rate from vessels using bottom-towed gear was reduced by 77 percent following wind farm construction in 11 of the 12 sites studied. However, the same study found evidence that wind farms offer protection to benthic habitat from bottom-towed gear, which could lead to biological spillover effects. In 2013, a socioeconomic wellbeing study was conducted in the UK following offshore wind farm development. The results suggested that the wind farms displaced effort, however the perceived socioeconomic wellbeing was unaffected because fishers expanded their operating range into more productive areas while market forces aided in offsetting economic losses (Stevenson, Tissot and Walsh 2013).

The offshore wind industry in the United States has the benefit of nearly a generation of research, development, and testing in Europe. Throughout that time, navigation impacts have been assessed and best practices have been developed. Offshore wind-related navigational accidents were studied in the UK from 2010 to 2019, and it was found that the majority of accidents occurred in inshore waterways during port approaches. Allisions with Wind Farm Support Vessels were more common than collisions, and recreational and fishing vessels were more likely to collide. Despite the usefulness of Navigation Risk Assessments in the UK, in assessing navigation hazards, there is considerable uncertainty in their models. The models tend to overestimate the frequency of navigation incidents. However, in the UK, accidents related to ocean renewable infrastructure are rare. Additionally, mitigation measures aimed at redirecting traffic flow may not necessarily enhance navigational safety since they can transfer the risk of turbine contact to an increased risk of vessel collision. (Rawson and Brito 2022; Rawson and Rogers 2015).

Regardless, economic impacts, injury or loss of life have the potential to burden the fishing industry and lead to further regulation of the wind industry. BOEM expects the shipping and fishing industries to adopt both technological and non-technology-based measures to reduce impacts on marine radar, including greater use of AIS and electronic charting systems, new technologies like LIDAR, employing more watchstanders, and simply avoiding wind farms altogether (National Academies of Sciences, Engineering, and Medicine 2022).

Traditional magnetron-based radar systems experience WTC, and it takes a skilled operator to weed out the false readings and clutter. Operator training on correctly reducing inaccuracies helps but does not

resolve the issue entirely (De le Vega 2013). The use of electronic charts in support of updated radar technologies and AIS is recommended.

However, systems integrating Doppler technology reduce the impact of WTC on imaging, aiding in navigation through these areas. Agencies and organizations utilizing HF radar have been working to develop algorithms and filters to reduce the inaccuracies and false readings caused by WTGs (Yang et al. 2014, De la Vega 2013).

Regulatory strategies to address the effect on the radars include mandatory requirements to update technology and require AIS on all vessels. Mandatory training on the common issues regarding radar and navigation systems would reduce the number of potential events and establish marine avoidance zones in which offshore wind farms reside. Since navigating around the wind farms entirely is the only confirmed way to avoid any allision with WTGs, it is the safest mitigation strategy.

Reduction in RCS is an effective way to reduce reflections of radar signals from WTGs, thus reducing signal shadowing from masking signals from smaller vessels (De le Vega 2013). Turbine design can influence the reflection of signals, including blade shape and dimensions, nacelle shape, and tower size and materials (National Academies of Sciences, Engineering, and Medicine 2022). The reduction in RCS due to optimal turbine design on each WTG could substantially reduce the overall influence of radar over a large farm.

The availability of filters and algorithms to reduce WTC in HF radar technology is promising. Land-based long-range HF radar can have gaps in data where wind farms are present (Gillman 2020). A way to mitigate this concern would be to share real-time telemetry data of surface currents and blade rotation rates to fill in those gaps. Reducing operations during inclement weather and when rescue efforts are being conducted within the zone is also proposed to reduce the chances of allision or other related incidents. USCG, the Navy and other parties that utilize this technology should not have an issue executing their efforts with the continued research and development of mitigation strategies. In the event of an incident within the proposed area, the 1 nm spacing between WTGs would give adequate room for rescue operations without worrying about further allision with another turbine.

Marking and lighting of offshore structures would conform to Coast Guard guidance if BOEM approves the Project. The lighting of WTGs, associated equipment, and vessels necessary for the operation and maintenance would have negligible impacts on navigation under Alternative B. A notional lighting plan has been included in the COP based on existing USCG regulations and policy and standards promulgated by the International Association of Marine Aids to Navigation and Lighthouse Authorities in Recommendation O-139, the Marking of Man-Made Offshore Structure (IALA 2013). The USCG has endorsed those standards. This includes any/all requirements that may be imposed in conjunction with BOEM's anticipated permit conditions. They also would 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). The WTGs and OCS-DC would be lit and marked in accordance with BOEM and USCG requirements for aviation and navigation obstruction lighting, respectively.

Port utilization: The USCG indicates that the ports of New Bedford, Fairhaven, Davisville, and Brayton Point have been upgraded to support offshore wind activities associated with the Rhode

Island/Massachusetts WEA, while the ports of Bridgeport, New London, Port Jefferson, and New York have announced upgrade projects to support the wind energy industry (USCG 2020). It is expected that vessel congestion would increase in the short-term, during construction and again during decommissioning. However, it is unlikely significant enough to impact safe navigation through wind farms (USCG 2020). Construction port facilities are expected to serve multiple offshore wind projects, and potentially multiple offshore wind related and other maritime industries. Specifically, the COP indicates the following are primary construction ports, Albany and/or Coeymans, New York (foundation), New London, Connecticut (staging and preassembly), and the Port of Davisville-Quonset Point, Rhode Island (construction management base) (COP, Section 3.3.10; Sunrise Wind 2023). Back-up options include the Port of New York-New Jersey, New York, the New Bedford Marine Commerce Terminal, Massachusetts, Sparrow's Point, Maryland, Paulsboro Marine Terminal, New Jersey, Port of Providence, Rhode Island and Port of Norfolk, Virginia (COP, Section 3.3.10; Sunrise Wind 2023).

Traffic: Construction and decommissioning activities associated with adjacent wind farms would result in an increase of vessel traffic near those areas. Additional impacts would include delays within or approaching ports; increased navigational complexity; detours to offshore travel or port approaches; or increased risk of incidents such as collision, strikes or allisions, and groundings. Other reasonably foreseeable future offshore projects would produce additional vessel traffic during construction, but because of their timing, they are not anticipated to use the same traffic routes. Construction of other offshore wind projects would be scheduled to minimize overlapping construction periods and reduce the number of construction vessels in operation at any given time, effectively reducing the cumulative impact on port congestion and construction vessel rerouting.

3.19.5.5 Conclusions

Impacts of the Proposed Action

Construction, installation, O&M, and decommissioning activities would impact navigation and vessel traffic within and around the SRWF. The anticipated impacts would be generated through increased vessel traffic, obstructions to navigation, delays within or approaching ports, increased navigational complexity, changes to navigation patterns, detours to offshore travel or port approaches; or increased risk of incidents such as collision, allision, and groundings. Therefore, BOEM expects the overall impact on navigation from the Proposed Action and ongoing activities to be **moderate** adverse, as the change in navigation and safety risk would be minimal.

Cumulative Impacts of the Proposed Action

In the context of reasonably foreseeable environmental trends and planned actions, the cumulative impacts under the Proposed Action resulting from individual IPFs would be **moderate** adverse. The main IPF is the presence of structures, which could alter navigation patterns as large vessels would likely navigate around the Project. Small vessels such as fishing vessels, recreational, and O&M tenders would navigate within the SRWF and DNV-GL predicts up to 1.61 incidents per year. Potential incidents range from collisions to allisions. DNV-GL concluded that there was no area shallow enough within or in the immediate vicinity of the Project.

3.19.6 Alternative C-1 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

Under the Fisheries Habitat Impact Minimization Alternative C-1, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS-DC within the proposed Project Area and associated IAC and SRWEC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, 8 WTG positions would be selected for removal to potentially reduce impacts to complex fisheries habitats that are the most vulnerable to long-term impacts. The impacts to navigation and vessel traffic generated by this alternative would not be expected to be greater than the proposed Project.

3.19.6.1 Construction and Installation

3.19.6.1.1 Onshore Activities and Facilities

Onshore development activities for Alternative C-1 would not be expected to impact navigation and vessel traffic.

3.19.6.1.2 Offshore Activities and Facilities

Under Alternative C-1, the construction and installation of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to if not slightly larger than described for the Proposed Action since the exclusion of turbines may lead to decreased uniformity and increased risk to vessel navigation. All WTG's including orphaned WTG's would remain aligned on the 1 by 1 nm grid with the rest of the Project Area.

3.19.6.2 Operations and Maintenance

3.19.6.2.1 Onshore Activities and Facilities

O&M associated with onshore activities and facilities would not be expected to impact navigation and vessel traffic.

3.19.6.2.2 Offshore Activities and Facilities

Under Alternative C-1, O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to if not slightly larger than described for the Proposed Action since the exclusion of turbines may lead to decreased uniformity and increased risk to vessel navigation.

3.19.6.3 Conceptual Decommissioning

3.19.6.3.1 Onshore Activities and Facilities

Onshore decommissioning activities associated with any alternative would not be expected to impact navigation and vessel traffic.

3.19.6.3.2 Offshore Activities and Facilities

Under Alternative C-1, the conceptual decommissioning of the proposed Project components would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to as described for the Proposed Action because there is no difference in the number of offshore components between the Proposed Action and Alternative C-1.

3.19.6.4 Cumulative Impacts of Alternative C-1

The cumulative impacts of Alternative C-1 activities are expected to affect navigation and vessel traffic through the following primary IPFs.

Anchoring: Future offshore wind developers are expected to coordinate with the maritime community and USCG to avoid laying export cables through any traditional or designated lightering/anchorage areas, meaning that any risk for deep-draft vessels would come from anchoring in an emergency scenario, specifically near the Narragansett Bay and Buzzards Bay traffic separation schemes (Table 3.19-2). Impacts on navigation and vessel traffic would be short-term and localized, and navigation and vessel traffic would fully recover following the disturbance. Thus, the contribution of Alternative C-1 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action.

Cable emplacement and maintenance: Under the Alternative C-1, SRWF and all other proposed offshore wind farms are is expected to plan a unique cable route. Cable emplacement would have short-term, localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions.

Presence of structures: The placement of structures would have long-term adverse impacts on vessel traffic in the Rhode Island/Massachusetts WEA. Ocean renewable infrastructure would likely displace large vessels while smaller vessels could still navigate through. In the event of an incident within the proposed area, the 1-nm spacing between WTGs would give adequate room for rescue operations without worrying about further allision with another turbine. Given these terms, the contribution of Alternative C-1 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action.

The lighting of WTGs, associated equipment, and vessels would have minimal to no impact on navigation under Alternative C-1 and the same as the Proposed Action.

Traffic: Construction and decommissioning activities associated with Alternative C-1 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action.

3.19.6.5 Conclusions

Impacts of Alternative C-1

Under Alternative C-1, impacts on navigation and vessel traffic from onshore and offshore construction, O&M, and decommissioning would be the same described for the Proposed Action. The anticipated impacts would be generated through increased vessel traffic, obstructions to navigation, delays within or approaching ports, increased navigational complexity, changes to navigation patterns, detours to offshore travel or port approaches; or increased risk of incidents such as collision, allision, and groundings. Therefore, BOEM expects the overall impact on navigation and vessel traffic from Alternative C-1 to be **moderate** adverse, as the change in navigation and safety risk would be minimal.

Cumulative Impacts of Alternative C-1

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to navigation and vessel traffic cumulative impacts from ongoing and future activities would be **moderate** adverse and the same as the Proposed Action.

3.19.7 Alternative C-2 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

3.19.7.1 Construction and Installation

Under the Fisheries Habitat Impact Minimization Alternative C-2, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OSS-AC within the proposed Project Area and associated IAC and SRWEC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, for Alternative C-2, in addition to excluding up to 8 WTG positions for development within the Priority Areas, up to another 12 WTG positions would be relocated to the eastern side to potentially further reduce impacts to complex fisheries habitats that are the most vulnerable to long-term impacts. The impacts generated by this alternative would not be expected to be greater than the proposed Project, as it would construct the same number of structures for sea surface navigation.

3.19.7.1.1 Onshore Activities and Facilities

Onshore construction and installation activities for Alternative C-2 would not be expected to impact navigation and vessel traffic.

3.19.7.1.2 Offshore Activities and Facilities

Under Alternative C-2, the construction and installation of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to if not slightly larger than

described for the Proposed Action since the exclusion of turbines may lead to decreased uniformity and increased risk to vessel navigation. All WTG's including orphaned WTG's would remain aligned on the grid with the rest of the Project Area.

3.19.7.2 Operations and Maintenance

3.19.7.2.1 Onshore Activities and Facilities

O&M associated with onshore activities and facilities would not be expected to impact navigation and vessel traffic.

3.19.7.2.2 Offshore Activities and Facilities

Under Alternative C-2, the O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to if not slightly larger than described for the Proposed Action since the exclusion of turbines may lead to decreased uniformity and increased risk to vessel navigation. All WTG's including orphaned WTG's would remain aligned on the grid with the rest of the Project Area.

3.19.7.3 Conceptual Decommissioning

3.19.7.3.1 Onshore Activities and Facilities

Onshore decommissioning activities associated with any alternative would not be expected to impact navigation and vessel traffic.

3.19.7.3.2 Offshore Activities and Facilities

Under Alternative C-2, the conceptual decommissioning of the proposed Project components would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to as described for the Proposed Action because there is no difference in the number of offshore components between the Proposed Action and Alternative C-2.

3.19.7.4 Cumulative Impacts of Alternative C-2

The cumulative impacts of Alternative C-2 activities are expected to affect navigation and vessel traffic through the following primary IPFs.

Anchoring: The effects of anchoring from Alternative C-2 are expected to be moderate and the same as the Proposed Action.

Cable emplacement and maintenance: Under the Alternative C-2, SRWF and all other proposed offshore wind farms are is expected to plan a unique cable route. Cable emplacement would have short-term,

localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions.

Presence of structures: The placement of structures would have long-term adverse impacts on vessel traffic in the Rhode Island/Massachusetts WEA. Given these terms, the contribution of Alternative C-2 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action. The lighting of WTGs, associated equipment, and vessels would have minimal to no impact on navigation under Alternative C-2 and the same as the Proposed Action.

Traffic: Construction and decommissioning activities associated with adjacent wind farms would result in an increase of vessel traffic near those areas. Thus, the contribution of Alternative C-2 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action.

3.19.7.5 Conclusions

Impacts of Alternative C-2

Under Alternative C-2, impacts on navigation and vessel traffic from onshore and offshore construction, O&M, and decommissioning would be the same described for the Proposed Action. The anticipated impacts would be generated through increased vessel traffic, obstructions to navigation, delays within or approaching ports, increased navigational complexity, changes to navigation patterns, detours to offshore travel or port approaches; or increased risk of incidents such as collision, allision, and groundings. Therefore, BOEM expects the overall impact on navigation from the Alternative C-2 alone to be **moderate** adverse, as the change in navigation and safety risk would be minimal.

Cumulative Impacts of Alternative C-2

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to navigation and vessel traffic impacts from ongoing and future activities would be **moderate** and the same as the Proposed Action.

3.19.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.19.8.1 Construction and Installation

3.19.8.1.1 Onshore Activities and Facilities

Onshore construction and installation activities for Alternative C-3 would not be expected to impact navigation and vessel traffic.

3.19.8.1.2 Offshore Activities and Facilities

Under Alternative C-3, the construction and installation of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to if not slightly less than described for the Proposed Action since there are fewer WTGs being installed.

3.19.8.2 Operations and Maintenance

3.19.8.2.1 Onshore Activities and Facilities

O&M associated with onshore activities and facilities would not be expected to impact navigation and vessel traffic.

3.19.8.2.2 Offshore Activities and Facilities

Under Alternative C-3, the O&M of the 11-MW WTGs, OCS-DC, IAC, and SWREC would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to if not slightly less than described for the Proposed Action since there are fewer WTGs being installed.

3.19.8.3 Conceptual Decommissioning

3.19.8.3.1 Onshore Activities and Facilities

Onshore decommissioning activities associated with any alternative would not be expected to impact navigation and vessel traffic.

3.19.8.3.2 Offshore Activities and Facilities

Under Alternative C-3, the conceptual decommissioning of the proposed Project components would occur within the range of design parameters outlined in the COP, subject to applicable mitigation measures. The impacts on navigation and vessel traffic would be similar to as described for the Proposed Action for decommissioning activities.

3.19.8.4 Cumulative Impacts of Alternative C-3

The cumulative impacts of Alternative C-3 activities are expected to affect navigation and vessel traffic through the following primary IPFs.

Anchoring: The effects of anchoring from Alternative C-3 are expected to be moderate and the same as the Proposed Action.

Cable emplacement and maintenance: Under the Alternative C-3, SRWF and all other proposed offshore wind farms are expected to plan a unique cable route. Cable emplacement would have short-term, localized adverse impacts on boating because of the need to navigate around construction activities and minimize exposure to hazardous conditions.

Presence of structures: The placement of structures would have long-term adverse impacts on vessel traffic in the Rhode Island/Massachusetts WEA. Given these terms, the contribution of Alternative C-3 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action.

Port utilization: The USCG indicates that the ports of New Bedford, Fairhaven, Davisville, and Brayton Point have been upgraded to support offshore wind activities associated with the Rhode Island/Massachusetts WEA, while the ports of Bridgeport, New London, Port Jefferson, and New York have announced upgrade projects to support the wind energy industry (USCG 2020). It is expected that vessel congestion would increase in the short-term, during construction and again during decommissioning. However, it is unlikely significant enough to impact safe navigation through wind farms (USCG 2020). Construction port facilities are expected to serve multiple offshore wind projects, and potentially multiple offshore wind related and other maritime industries. Specifically, the COP indicates the following are primary construction ports, Albany and/or Coeymans, New York (foundation), New London, Connecticut (staging and preassembly), and the Port of Davisville-Quonset Point, Rhode Island (construction management base) (COP, Section 3.3.10; Sunrise Wind 2023). Back-up options include the Port of New York-New Jersey, New York, the New Bedford Marine Commerce Terminal, Massachusetts, Sparrow's Point, Maryland, Paulsboro Marine Terminal, New Jersey, Port of Providence, Rhode Island and Port of Norfolk, Virginia (COP, Section 3.3.10; Sunrise Wind 2023).

Traffic: Construction and decommissioning activities associated with adjacent wind farms would result in an increase of vessel traffic near those areas. Thus, the contribution of Alternative C-2 to navigation and vessel traffic impacts from ongoing and future activities would be moderate and the same as the Proposed Action.

3.19.8.5 Conclusions

Impacts of Alternative C-3

Under Alternative C-3, impacts on navigation and vessel traffic from onshore and offshore construction, O&M, and decommissioning would be the slightly less than described for the Proposed Action. The anticipated impacts would be generated through increased vessel traffic, obstructions to navigation, delays within or approaching ports, increased navigational complexity, changes to navigation patterns, detours to offshore travel or port approaches; or increased risk of incidents such as collision, allision, and groundings. Therefore, BOEM expects the overall impact on navigation from the Alternative C-3 alone to be **moderate** adverse, as the change in navigation and safety risk would be minimal.

Cumulative Impacts of Alternative C-3

In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-3 to navigation and vessel traffic impacts from ongoing and future activities would be **moderate** adverse and slightly less than the Proposed Action.

3.19.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2 and C-3 would have the same overall negligible to moderate adverse impacts on navigation and vessel traffic. Table 3.19-2 provides an overall summary of alternative impacts.

Table 3.19-2. Comparison of Impacts on Navigation and Vessel Traffic

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: BOEM anticipates that impacts on navigation and vessel traffic from the No Action Alternative would be **moderate** adverse impacts. *Cumulative Impacts of the No Action Alternative:* In context of reasonably foreseeable environmental trends, BOEM anticipates that the cumulative impacts resulting from all of the IPFs together would be **moderate** adverse and not disrupt vessel traffic.	*Proposed Action:* BOEM anticipates that the impacts resulting from the Proposed Action would be **moderate**. Therefore, BOEM expects the overall adverse impact on navigation from the Proposed Action and ongoing activities to be **moderate**, as the change in navigation and safety risk would be small. *Cumulative Impacts of the Proposed Action:* In the context of reasonably foreseeable environmental trends and planned actions, the cumulative impacts under the Proposed Action resulting from individual IPFs would be **moderate**. The main IPF is the presence of structures, which could alter navigation patterns as large	*Alternative C-1:* BOEM anticipates that the impacts resulting from the Proposed Action would be **moderate.** Therefore, BOEM expects the overall adverse impact on navigation and vessel traffic from Alternative C-1 to be **moderate**, as the change in navigation and safety risk would be small. *Cumulative Impacts of Alternative C-1:* In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-1 to navigation and vessel traffic cumulative impacts from ongoing and future activities would be **moderate** and the same as the Proposed Action.	*Alternative C-2*: BOEM anticipates that the impacts resulting from the Proposed Action would be **moderate.** Therefore, BOEM expects the overall adverse impact on navigation and vessel traffic from Alternative C-2 to be **moderate**, as the change in navigation and safety risk would be small. *Cumulative Impacts of Alternative C-2*: In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-2 to navigation and vessel traffic cumulative impacts from ongoing and future activities would be **moderate** and the same as the Proposed Action	*Alternative C-3:* BOEM anticipates that the impacts resulting from the Proposed Action would be **moderate.** Therefore, BOEM expects the overall adverse impact on navigation and vessel traffic from Alternative C-3 to be **moderate**, as the change in navigation and safety risk would be small. *Cumulative Impacts of Alternative C-3:* In the context of reasonably foreseeable environmental trends, the contribution of Alternative C-3 to navigation and vessel traffic cumulative impacts from ongoing and future activities would be **moderate** and the same as the Proposed Action

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
	vessels would likely navigate around the Project.			

3.19.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Under Alternative C-3b, impacts on navigation and vessel traffic from onshore and offshore construction, O&M, and decommissioning would be the slightly less than described for the Proposed Action. The anticipated impacts would be generated through increased vessel traffic, obstructions to navigation, delays within or approaching ports, increased navigational complexity, changes to navigation patterns, detours to offshore travel or port approaches; or increased risk of incidents such as collision, allision, and groundings. BOEM anticipates that the impacts resulting from the Proposed Action would be **moderate**. Therefore, BOEM expects the overall impact on navigation from the Alternative C-3b alone to be **moderate**, as the change in navigation and safety risk would be slightly less.

3.19.11 Proposed Mitigation Measures

The mitigation measures listed in Table 3.19-3 are recommended for inclusion in the Preferred Alternative.

Table 3.19-3. Proposed Mitigation Measures: Navigation and Vessel Traffic

Measure	Description	Effect
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 NYS Public Service Commission on March 27, 2023 are also generally applicable to those portions of the cable in federal waters	This measure would not modify the impact determinations for navigation and vessel traffic but would ensure that these effects do not exceed the levels analyzed herein.
Develop 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 would 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.	This measure would not modify the impact determinations for navigation and vessel traffic but would ensure that these effects do not exceed the levels analyzed herein.

3.19.11.1 Effect of Measures Incorporated into the Preferred Alternative

The mitigation measures listed in Table 3.19-3 are recommended for inclusion in the Preferred Alternative. A cable maintenance plan 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. Lastly, Sunrise Wind would develop a Mariner Communication Plan, coordinate with other mariners, including the commercial shipping industry and recreational users via a mariner communication plan. This plan would 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, 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. These measures, if adopted, would have the effect of reducing the overall moderate impact from the Preferred Alternative.

3.21 Recreation and Tourism

3.21.1 Description of the Affected Environment and Future Baseline Conditions

As a resource, recreation and tourism is described as the relationship between the natural setting and resources of an area with public use and values of the resources (BOEM 2012). This section describes the affected environment and potential effects related to recreation and tourism from the construction and installation, O&M, and conceptual decommissioning of the SRWF within the GAA, which includes the vicinity of the Project in the expanded Region of Influence (ROI) (COP Figure ES-1, Sunrise Wind 2023; COP Table 4.7-1; Sunrise Wind 2023). The GAA includes the communities within the viewshed, defined as the area within a 40-mile (64.4 km) radius of the SRWF; resources adjacent to the landfall construction area, including land within the Fire Island National Seashore boundary, Smith Point County Park boundary, and Otis Pike Wilderness boundary; 1,000 ft (304.8 m) into the Atlantic Ocean, and up to 4,000 ft (1,219.2 m) into Great South Bay that is located within the boundary of the Fire Island National Seashore; a 3-mile (4.8-km) radius around the proposed OnCS-DC site (Union Avenue site); and portions of the towns of Brookhaven and Islip along with small portions of the villages of Lake Grove and Patchogue and the cable landfall and cable routes to the OnCS-DC site, as described in Appendix D, Figure D-19, that could experience potential effects of the SRWF on recreation and tourism. Please refer to Appendix D, Figure D-18, to view the GAA for Recreation and Tourism activities related to the proposed Project. Recreation and tourism resources associated with the proposed Project are primarily related to coastal and nearshore/offshore activities, with inland and open ocean recreation and tourism activities also considered. In the proposed Project Area, there are extensive opportunities for recreation and tourism activities to occur based on the landscape and natural resources in this region. These activities can occur in a wide variety of manners; they can require recreational equipment, occur in groups or individually, can require specialized skills, and can be passive (e.g., sunbathing or wildlife viewing) or active (e.g., swimming or hiking) recreational and tourism activities. The location, environment, and landscape of the Project provide opportunities for a variety of high-quality recreation and tourism experiences. In these communities, the scenic quality and natural resources associated with the coastal environment can be an important contributing factor to recreation and tourism activities and experiences.

The proposed Project facilities would occur on land in New York and could result in potential effects to coastal communities in New York, Connecticut, Massachusetts, and Rhode Island. BOEM ranked and evaluated the potential sensitivity of coastal communities along the east coast of the United States. In this analysis, 113 geographic areas were analyzed, 16 were within the states in the expanded ROI (ICF 2012). Recreation and tourism constitute a sizable portion of the coastal economies of the states and counties affected by the Project. The NOAA gathers data regarding ocean economies by collecting the economic data for six different sectors that are dependent upon the ocean and Great Lakes. These six sectors are marine construction, living resources, offshore mineral extraction, ship and boat building, tourism and recreation, and marine transportation. The economic activities considered are based only on those that are related to the ocean economy. The dataset only includes establishments located in shore-adjacent zip codes, and for establishments such as restaurants or hotels, only includes those nearest to the coast. The Tourism and Recreation sector is composed of North American Industry

Classification System data for the categories Sporting and Athletic Goods Manufacturing, Scenic and Sightseeing Transportation, Sports and Recreation Instruction, Recreation Goods Rental, Amusement and Recreation Services Not Elsewhere Classified, Zoo and Botanical Gardens, and Nature Parks and Other Similar Institutions (NMFS 2021b). A summary of ocean economic data for counties identified in the ROI identified in Section 3.16, *Demographics, Employment, and Economics,* is aggregated in Table 3.21-1. Recreation and tourism were predominant sources of ocean economic activity for the majority of the locations and make up a significant portion of the economies of the geographic areas within the ROI.

Table 3.21-1. 2018 Ocean Economies Tourism and Recreation Data for Counties and States That Would Be Directly or Indirectly Affected by the Sunrise Wind Project

Location	Number of Establishments (% of total establishments in ocean economy)	Number of Employed Residents for Tourism and Recreation (% of total residents employed in ocean economy)	Total Wages for Tourism and Recreation (% of total wages generated by ocean economy)	Total GDP for Tourism and Recreation (% of total GDP generated by ocean economy)
New York (NY)	22,269 (93%)	359,193 (91%)	$12.6 billion (83%)	$29 billion (87%)
Suffolk, NY	2,740 (90%)	36,385 (88%)	$921.1 million (70%)	$1.9 billion (74%)
Connecticut (CT)	2,830 (91%)	39,238 (68%)	$992 million (40%)	$2 billion (44%)
New London, CT	490 (91%)	7,397 (36%)	$176.5 million (13%)	$374.3 million (16%)
Massachusetts (MA)	4,775 (81%)	79,117 (80%)	$2.2 billion (59%)	$4.7 billion (60%)
Barnstable, MA	1,222 (90%)	17,028 (94%)	$489 million (88%)	$1.1 billion (87%)
Bristol, MA	193 (38%)	2,963 (49%)	$55 million (19%)	$105.8 million (16%)
Dukes, MA	167 (91%)	1,394 (97%)	$52.9 million (96%)	$120.1 million (97%)
Nantucket, MA	134 (94%)	1,668 (99%)	$71.2 million (99%)	$159.7 million (99%)
Plymouth, MA	642 (87%)	9,180 (87%)	$203.8 million (71%)	$400.9 million (71%)
Rhode Island (RI)	2,248 (91%)	37,127 (81%)	$850.8 million (60%)	$1.9 billion (58%)
Kent, RI	373 (96%)	7,338 (96%)	$148.5 million (92%)	$321.8 million (93%)
Newport, RI	421 (91%)	6,976 (82%)	$184.4 million (54%)	$444.1 million (57%)
Providence, RI	873 (94%)	14,803 (92%)	$326.3 million (85%)	$700 million (88%)
Washington, RI	441 (86%)	6,032 (53%)	$145.2 million (32%)	$327.6 million (28%)

Source: NOAA 2018

The GAA supports inland, coastal or beach, and ocean-based activities related to recreation and tourism. The majority of recreation and tourism activities that are potentially impacted by the SRWF occur close to the shore and along the shoreline. The summer months of June, July, and August are when approximately two-thirds of trips are made to the beach on the east coast of the United States, thus representing the time with the largest potential impacts (Parsons and Firestone 2018). Common

recreational activities in the GAA include beach-going, photography, walking/hiking, swimming, surfing, paddleboarding, kite sailing, wildlife watching, kayaking, boating, boat-fishing, sailing, parasailing, yachting, harbor cruises, with further offshore activities including recreational boating, sailboat racing, yachting, cruise ship tourism, scuba diving, and offshore wildlife viewing (ICF 2012; NYSERDA 2017). The majority of these activities occur at higher intensities along and adjacent to the shoreline and along the oceanfront closer to shore.

Offshore activities include wildlife watching, scuba diving, boating, sailboat racing, and recreational fishing. Three scuba diving sites were identified within 2 mi (3.2 km) of the SRWEC and the SRWF; the Moriches Anglers site, the SeaWolf site, and the Suffolk site. Six offshore recreational dive sites were identified as sensitive within the Area of Analysis of NYSERDA's *Offshore Wind Master Plan-Marine Recreational Uses Study*, with one being present in the expanded ROI, located southeast of Montauk, New York (NYSERDA 2017). These sites were classified as sensitive due to their cultural, historic, high conservation, or human use values. Many of the offshore recreation activities are directly linked with local businesses centered around tourism, including hotels, restaurants, and other leisure activities.

Sailboat, boat, and yacht races occur within the GAA. Many of these races are associated with local yacht clubs and marinas. The races can range from approximately 15 vessels to over 150 vessels depending on the event and typically occur from May to September (ICF 2012). Larger events include, but are not limited to, the Newport to Bermuda Yacht Race, the Fishers Island Yacht Club Round Island Race, the Long Island Sound IRC/PHRF Championships, and the Storm Trysail Foundation/Fishers Island Yacht Club Jr. Safety at Sea race (ICF 2012; Bloeser et al. 2015; COP Figure 4.7.3-1; Sunrise Wind 2023; COP Table 4.7.3-1; Sunrise Wind 2023; COP Table 4.7.3-2; Sunrise Wind 2023).

Recreational boating and fishing are significant recreational activities that occur in coastal waters in the GAA. The *2012 Northeast Recreational Boater Survey* identified recreation and tourism locations and routes within the GAA, and estimated that during the 2012 study season, there were approximately 817,368 boating trips in ocean and coastal waters by boaters documented and registered in the four states within the GAA, Connecticut, Massachusetts, New York, and Rhode Island (SeaPlan 2013). There were many routes used by recreational boaters identified in the GAA (COP Figure 4.7.4-1; Sunrise Wind 2023). In this survey, 52 percent of boating trips occurred within 1 mi (1.6 km) of the coastline, with the largest levels in harbors and partially protected bays near major cities (SeaPlan 2013).

Recreational fishing of highly migratory species and fishing along the coastline are both popular in the GAA and throughout Southern New England waters. NOAA compiles estimates of data related to recreational fisheries, including the number of participants, number of trips by state, and estimates of the recreational catch. In 2019, marine recreational anglers on the Atlantic coast caught a total of 597 million fish on almost 130 million trips (NMFS 2021a). More than 10 percent of these trips, approximately 13 million trips, were made in New York and almost 6 percent of total trips, approximately 7.8 million trips, were made from Massachusetts. The most commonly caught non-bait species by number were black sea bass (*Centropristis striata*), bluefish (*Pomatomus saltatrix*), striped bass (*Morone saxatilis*), summer flounder (*Paralichthys denatus*), and scup (*Stenotomus chrysops*). By weight, the largest harvest of fish were striped bass, bluefish, scup, dolphinfish, and black sea bass (NMFS 2021a).

Fishing occurs from shore, from fishing piers, near shore in boats, and offshore in boats (ICF 2012). Recreational fishing efforts were studied at the nearby Vineyard Wind lease area with data collected through an online survey that had responses from 136 private anglers, 34 charter/headboat captains, and one unknown respondent, data from NMFS Large Pelagics Intercept Survey, and tagging data (Kneebone and Capizzano 2020). It was identified that there was widespread angling effort of highly migratory species throughout Southern New England seasonally from June to October, with fleets of 50-100 recreational vessels sometimes congregating to target popular HMS in small geographic areas (Kneebone and Capizzano 2020). Approximately 12 percent of HMS trips from 2002 through 2018 occurred within the Rhode Island/Massachusetts lease areas. In the WEA, Coxes Ledge, The Fingers, and The Claw had the highest amount of effort, with a large amount of effort reported in areas both inside and outside of the WEA (Kneebone and Capizzano 2020). Recreational fishermen would also have to travel through the WEA to reach some of the southern New England canyons, and to other popular fishing grounds, including The Dump, Tuna Ridge, The Horns, and The Lanes (Kneebone and Capizzano 2020). Section 3.14, *Commercial Fisheries and For-Hire Recreational Fishing*, provides additional detail on for-hire recreational fishing and commercial fishing.

Within the ROI, there are 346 public beaches, 226 marinas, 82 harbors, 83 yacht clubs, and nine national parks and wildlife refuges (COP Section 4.7.3.1; Sunrise Wind 2023). These include: Suffolk County, NY: Fire Island National Seashore and Sagamore Hill National Historic Site; Barnstable County, Massachusetts: Cape Cod National Seashore, Mashpee NWR, and Monomoy NWR; Bristol County Massachusetts: New Bedford Whaling National Historical Park; Nantucket County, Massachusetts: Nantucket NWR; Newport County RI: Touro Synagogue National Historic Site; and Providence County, RI: Roger Williams National Memorial. The communities located within the ROI have a variety of resources that support and have shaped the recreation and tourism industries (COP Table 4.7.3-3; Sunrise Wind 2023). The closest communities to the Project in Massachusetts and Rhode Island, Martha's Vineyard, and Block Island respectively, both have economies that are highly dependent upon recreation and tourism. Both communities are accessible only by boat or by air. On Block Island, water sports are popular recreation activities, including snorkeling, sailing, parasailing, fishing, boating, wildlife viewing, and kayaking (COP Section 4.7.3.1; Sunrise Wind 2023). Other coastal communities in Massachusetts and Rhode Island have major tourism and recreation industries centered around their beaches and coastal activities (ICF 2012). Public beaches are prominent throughout the ROI, with 202 public beaches present between Barnstable, Bristol, Dukes, Nantucket, and Plymouth counties. The tourism industry in these areas have high levels of tourism with activities that include beach-going, yachting, sailing, and visiting cultural landmarks, such as lighthouses.

The proposed Project's Onshore Facilities would be located in Suffolk County, which has many summer tourism destinations and approximately 980 mi (1,577 km) of coastline, including Montauk, the Hamptons, and Fire Island (Bolger 2016). Southampton is a popular recreation and tourism destination that has two of America's 10 top-rated golf courses, shops and attractions, and white sand beaches (ICF 2012). The Fire Island National Seashore encompasses 19,579 ac (79.2 km^2) of protected land that features high dunes, forestland, undeveloped sandy beaches, and abundant wildlife that attracts large numbers of visitors, including surfers, nature enthusiasts, campers, boaters, and beachgoers (ICF 2012; Bolger 2016). The Fire Island National Seashore was established "[f]or the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches,

dunes, and other natural features within Suffolk County, New York, which possess high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban population" (16 *USC* § 459e(a)). This area also houses the Fire Island Lighthouse, listed on the National Register of Historic Places, a culturally and historically significant monument (NPS 2018). In 2017, 681,518 people visited the National Park sites on the Fire Island National Seashore. The Fire Island National Seashore has communities, the Otis Pike Wilderness Area, natural areas, and historical and cultural resources within its boundaries (see Figure 3.18-1 in Section 3.18, *Land Use and Coastal Infrastructure*). The Fire Island Wilderness center and associated parking serves as the eastern entry point to the Otis Pike Fire Island Dune Wilderness, which is the only example of a federally designated wilderness area in New York (NPS 2023c). The Fire Island Wilderness Visitor Center includes a ranger contact station, second floor viewing area, and exhibit space (NPS 2023c). More than three-quarters of Fire Island National Seashore is marine or estuarine habitat, with 14,644 ac (59.3 km^2) of the park consisting of open water. The Seashore boundary extends 1,000 ft (304.8 m) into the Atlantic Ocean from Moriches Inlet to Robert Moses State Park, and up to 4,000 ft (1,219.2 m) into the Great South Bay, and Bellport, Narrow and Moriches Bay (NPS 2023a). In 2021, 255,000 park visitors spent an estimated $11.1 million in local gateways while visiting Fire Island National Seashore. These expenditures supported a total of 110 jobs, $6.1 million in labor income, $9.9 million in value added, and $14.9 million in economic output in local gateway economies surrounding Fire Island National Seashore (NPS 2022).

The proposed Project's onshore facilities would be located adjacent to community spaces that are used by the public for various reasons, including recreation and tourism, and that contribute to the local community culture and environment. The Project landfall would occur at Smith Point County Park, located on the eastern portion of Fire Island and within the boundary of Fire Island National Seashore. The County Park occupies 2,293 ac (928 ha) and includes 270 campsites, a protected beach, boat launch, and amenities (Discover Long Island 2023). The TWA Flight 800 International Memorial and Garden is located within Smith Point County Park. This area was opened to the public on July 17, 1996 to memorialize the victims of TWA Flight 800, which crashed off Fire Island on July 17, 1996 (NPS 2023b). This area provides a wide variety of recreational opportunities and services not available at national park facilities on Fire Island.

Adjacent to the route of the proposed Project's onshore transmission cable includes a county park, a U.S. Fish and Wildlife Service administered wildlife refuge, a church, and a fairground. All of these areas are considered to be community spaces and are utilized by the public and contribute to the local community culture and environment. The Southaven County Park is located north of the Sunrise Highway and bisected by the Carmans River. The Southaven County Park occupies 1,323 ac (525 ha) and includes camping facilities, high-capacity picnic areas, fishing and boating access, and public trails (Discover Long Island 2023). The Wertheim NWR provides visitors with opportunities for wildlife viewing, hiking, fishing, educational programs and special events offered by refuge staff, interns, and volunteers. The Wertheim National Refuge protects 2,550 ac (1,032 ha) of grasslands, oak-pine woodlands, and fresh, brackish, and saltwater wetlands (USFWS 2023). Although the Brookhaven Fair has been in hiatus since 2020 when it was postponed due to the COVID-19 pandemic, the Brookhaven Fairgrounds are located south of the Long Island Expressway at 440 Express Drive South (Brookhaven Fair 2023). The Long Island Baptist Church is located at 125 Long Island Avenue, Holtsville, New York 11742. Weekly Services and prayer

meetings are held at this church and offers a community space to be utilized by the public (Long Island Baptist 2023).

Under the Proposed Action, there are a variety of potential port facilities where an operations and management facility for the SRWF would be established (COP Table 3.3.10-1; Sunrise Wind 2023; COP Figure 3.3.10-1; Sunrise Wind 2023). These port locations would include New York (the Port of Brooklyn, Port Jefferson, and Port of Montauk) and in Rhode Island (Port of Davisville, Quonset Point, and the Port of Gailee). These ports are currently all primarily industrial, with limited recreation and tourism activities occurring in the adjacent vicinities.

3.21.2 Impact Level Definitions for Recreation and Tourism

This Final EIS uses a four-level classification scheme to analyze potential impact levels on recreation and tourism from the alternatives, including the Proposed Action. Impacts are categorized as beneficial or adverse and may be short-term or long-term in duration. Short-term impacts may occur over a period of a year or less. Long-term impacts may occur throughout the duration of a project or beyond project operations and decommissioning. Table 3.21-2 lists the definitions for both the potential adverse impact levels and potential beneficial impact levels for recreation and tourism. Table G-20 in Appendix G identifies potential IPFs, Issues, and Indicators to assess impacts to recreation and tourism.

The analysis for recreation and tourism has a strong relationship to visual resources, Section 3.22, *Scenic and Visual Resources*, as the setting of recreation and tourism is highly dependent upon the viewscape of the area.

Table 3.21-2. Definitions of Potential Adverse and Beneficial Impact Levels for Recreation and Tourism

Impact Level	Definition of Potential Adverse Impact Levels	Definition of Potential Beneficial Impact Levels
Negligible	No measurable impacts to the recreation setting, recreation opportunities, or recreation experiences would occur.	No measurable impacts or effects to the recreation setting, recreation opportunities, or recreation experiences would occur.
Minor	Impacts would not disrupt the normal functions of the affected activities and communities.	A small and measurable benefit for tourism or recreation activities in the GAA.
Moderate	The affected activity or community would have to adjust somewhat to account for disruptions due to the project.	A notable and measurable benefit for tourism or recreation activities in the GAA.
Major	The affected activity or community would have to adjust to significant disruptions due to large local or notable regional adverse impacts of the project.	A large local, or notable regional benefit for tourism or recreation and tourism in the GAA.

3.21.3 Impacts of Alternative A – No Action on Recreation and Tourism

When analyzing the impacts of the No Action Alternative on recreation and tourism, BOEM considered the impacts of ongoing and planned non-offshore wind activities and other offshore activities, including ongoing non-offshore wind and ongoing offshore wind activities on the baseline conditions for recreation and tourism. The cumulative impacts of the No Action Alternative considered the impacts of the No Action Alternative in combination with other planned non-offshore wind and offshore wind activities, as described in Appendix E (*Planned Activities Scenario*).

3.21.3.1 Impacts of the No Action Alternative

Under the No Action Alternative, baseline conditions for recreation and tourism described in Section 3.21.1, *Affected Environment*, would continue to follow current regional trends and respond to IPFs introduced by ongoing activities. Ongoing non-offshore wind activities within the GAA that contribute to impacts on recreation and tourism include undersea transmission lines, gas pipelines, other submarine cables, tidal energy projects, marine minerals use and ocean-dredged material disposal, military uses, marine transportation, fisheries and management, global climate change, oil and gas activities, and onshore development activities. Specifically, within the vicinity of landfall within Fire Island National Seashore, ongoing and planned non-offshore wind activities that contribute to such impacts include other submarine cables, wildlife and fisheries management, global climate change, and onshore development activities. These activities are expected to continue at current trends and have the potential to affect recreation and tourism. Recreation and tourism activities would experience periodic disruption from these activities, but would not be significantly impacted, as they are a typical part of daily life along the coast in the GAA. It is expected that visitors would continue to pursue recreation and tourism activities that rely on the area's coastal and ocean environment, scenic qualities, natural resources, and establishments that provide services for recreation and tourism activities. The beach, and by proxy the ocean, are resources that are of primary concern for recreation and tourism.

Ongoing offshore wind activities within the GAA that contribute to impacts on recreation and tourism include:

- Continued O&M of the Block Island project (5 WTGs) installed in state waters; and
- Ongoing construction of two offshore wind projects, the Vineyard Wind 1 project (62 WTGs and 1 OSS) in OCS-A 0501 and the South Fork project (12 WTGs and 1 OSS) in OCS-A 0517.

Ongoing O&M of Block Island and ongoing construction of the Vineyard Wind 1 and South Fork projects would affect recreation and tourism through the primary IPFs of traffic, anchoring, port utilization, lighting, presence of structure, and new cable emplacement and maintenance. Ongoing offshore wind activities would have the same type of impacts from the IPFs that are described in detail in the following section for planned offshore wind activities, but the impacts would be of lower intensity.

3.21.3.2 Cumulative Impacts of the No Action Alternative

The cumulative impact analysis for the No Action Alternative considers the impacts of the No Action Alternative in combination with other planned non-offshore wind activities and planned offshore wind activities (without the Proposed Action).

Other planned non-offshore wind activities that may affect recreation and tourism include undersea transmission lines, gas pipelines, other submarine cables, tidal energy projects, marine minerals use and ocean-dredged material disposal, military uses, marine transportation, fisheries and management, global climate change, oil and gas activities, and onshore development activities.

The sections below summarize the potential impacts of planned offshore wind activities on recreation and tourism during construction, O&M, and decommissioning of the projects. BOEM anticipates future offshore wind activities to affect recreation and tourism through the following primary IPFs.

Traffic: The construction and decommissioning of future offshore wind projects would generate increased onshore vehicle traffic in localized areas near ports needed for construction activities. Traffic would occur on existing roadways that are used by recreators. During construction, safety guidelines and plans would be implemented to prevent most adverse impacts for recreational users. The construction of offshore projects would result in small increases in vehicle traffic from O&M activities, and therefore, would present minor, short-term impacts on recreational users in the impacted area and negligible long-term adverse impacts as a result of maintenance activities.

Future projects would generate increased vessel traffic, predominantly during construction and decommissioning activities, but also with operation and maintenance of facilities, which could result in nuisances for recreational vessels. The impacts would occur within the GAA, largely along routes between ports and potential construction areas. The exact vessel traffic associated with each future project is not known, but the construction of the proposed SRWF would be expected to use 69 different vessels, that would not all be operating at the same time (COP Section 4.8.1.2; Sunrise Wind 2023). Increased vessel traffic could result in collisions, minor delays, or route adjustments for recreational vessels in the GAA. The risks and associated impacts would increase if future offshore wind facilities were simultaneously under construction. However, the majority of construction-related vessel traffic would be located within temporary safety zones and safety guidelines would be established to help minimize potential adverse impacts and risks with recreational and tourism-related activities. Increased traffic would be higher during construction, thus resulting in greater inconveniences. However, the increased traffic would be short-term and localized during these activities and should not incrementally add to adverse impacts. Vessel traffic associated with operation and maintenance of future projects would likely be much lower than during the construction period but would add on to the impacts of vessel traffic associated with other projects. Vessel traffic from offshore wind activities would represent a small portion of total vessels. Impacts from increased vessel traffic due to future offshore wind development are anticipated to result in minor, localized adverse impacts on recreational users.

Anchoring: With increased vessel traffic, there would also be an increase in anchoring. Anchoring impacts to fish species targeted for recreational fishing are addressed in Section 3.14.3. The presence of additional anchored vessels within the GAA and the development of areas with cable hardcover or scour protection could result in adverse impacts to recreational vessels by limiting or making it more difficult

to anchor in areas. The largest portion of anchored vessels associated with the offshore wind development would be located in offshore work areas during construction and decommissioning activities. During these periods, anchored construction-related vessels would most likely be within established temporary safety zones established by the USCG. These safety zones would be located around all marine construction activities, including each WTG site, OCS-DC site, and each cable-laying vessel. During construction activities at the Block Island Wind Farm, the Coast Guard established a 500-yard safety zone around each location where WTGs and cables were installed[4]. The size of the safety zone for the SRWF has not yet been established, but it is anticipated that it would be similar to the that established at the Block Island Wind Farm. Within the GAA, future offshore wind development is expected to lead to overlapping construction periods and increases in survey activities. Once a project has been constructed, vessel anchoring would also occur during O&M activities. The development of offshore wind projects would likely result in an increase in the number of anchored vessels and work platforms that could impact recreation and tourism vessels. There would be localized, short-term impacts on recreational boating from anchored construction, survey, or service vehicles. Adverse impacts are anticipated to range from minor to moderate, depending upon the frequency and number of anchored vessels needed, as this leads to inconvenience and navigational complexity for recreational vessels and would be less frequent during operations.

Port utilization: The utilization of ports for staging and construction activities for future projects could also provide facilities for recreational boats or may be on waterways that are shared with recreational marinas. The majority of regional ports that are suitable for staging and construction activities associated with offshore wind are primarily industrial, with recreational activity use being secondary. If improvements at ports are necessary for construction, it could result in short-term adverse impacts during construction, but long-term benefits for improvements to facilities and channels for recreational vessels. Regardless of future offshore wind development, recreation and tourism activities related to current marine industrial activities at existing ports would not experience significant changes (BOEM 2016). Therefore, the impact of port utilization to recreation and tourism would be negligible.

Light: Construction of future projects could result in light impacts for recreational users and tourists. Some projects would result in the construction of new visible structures or lighting during the nighttime at onshore locations. The majority of onshore project components are expected to be located in areas that are already lighted and previously developed, minimizing adverse impacts. The adverse effects to recreation and tourism of lighting from onshore construction would be short-term and localized.

The construction of future offshore wind projects would require nighttime, dusk, or early morning lighting on WTGs, vessels, and platforms that may be visible to tourists, onshore recreational users, and offshore boaters recreating at those times. Permanent aviation warning lighting on the WTGs could cumulatively adversely impact recreation and tourism activities from south-facing beaches within the GAA if lighting is a factor that is considered when deciding locations to visit. Previous studies found that WTGs visible more than 15 mi (24.1 km) from the viewer would have negligible impacts on recreation and tourism activity, which is where BOEM-related projects would be located (Parsons and Firestone

[4] As described in 81 *Federal Register* 31862. https://www.federalregister.gov/documents/2016/05/20/2016-11826/safety-zone-block-island-wind-farm-rhode-island-sound-ri

2018). Aviation warning lighting would be visible from shore and would vary in both appearance and intensity depending upon the elevation of the viewer, height of the WTG, and the distance between the two. However, it has been found that an ADLS could result in over a 99 percent reduction in system activated duration as compared to traditional always-on obstruction lighting systems (COP Section 4.8.1.2; Sunrise Wind 2023).

The GAA includes the southern shores of Martha's Vineyard and the western shores of Nantucket, both of which are part of the viewshed. These areas include landscapes that are characterized by bluffs, beaches, dunes, and tidal marshes with low development density in this area, leading to there being very little existing nighttime lighting. This would lead to more pronounced impacts to these areas than to viewsheds that are located in developed and industrial areas. Nighttime lighting on WTGs would add to cumulative visual impacts on recreation and tourism in the GAA. These impacts would be long-term and continuous and would vary between minor to moderate adverse impacts for recreation and tourism dependent upon the project and the distance of the user from the modified feature.

Presence of structures: The development of future offshore wind projects in the Rhode Island Massachusetts Lease Areas would include the presence of in-water structures, including WTGs and the offshore substations/converter stations that would have impacts on recreation and tourism. In-water structures would remain in place for up to 30 years from installation until the decommissioning of the facility. These project features would be the most visible and would have the highest impact on the viewshed of recreational users and tourists. Adverse impacts to recreational boating and fishing include the risk of collision; risk of gear entanglement, damage, or loss; navigational hazards; presence of cable infrastructure; visual impacts; and space-use conflicts.

The risk of collision with WTGs or offshore substations/converter stations is greater for smaller vessels, including recreational vessels, moving in close proximity to installed facilities. However, the *2012 Northeast Recreational Boater Survey* found that 52 percent of recreational boaters within the area of analysis typically traveled within 1 nm of the coastline (SeaPlan 2013). Larger recreational vessels generally remain within 3 to 10 nm of the coast, and this trend is expected to continue into the future. This would reduce potential conflict between recreational boating and in-water structures of future offshore wind development, as the Lease Areas in Rhode Island and Massachusetts are located further offshore.

Recreational vessels that travel further offshore, including recreational fishing vessels, long-distance sailboat races, wildlife watching boats, large sailing vessels, and sightseeing tours, would be impacted by in-water structures. This could result in recreational users having to change the routes that they use to avoid the in-water structures. Wildlife watching boats, including whale watchers, and sightseeing boats often travel further offshore where wildlife is more likely to be present, and would need to take extra caution in navigating through or around future projects. Large sailing vessels would likely navigate away from future offshore wind projects if they are equipped with masts taller than the lowest elevation of WTG blade tips. The height of the WTGs would vary with the size of the WTGs installed in future offshore wind farms. Depending upon the route chosen, the Transatlantic Race, Marion Bermuda Race, and Newport Bermuda Race, long-distance sailboat and yacht races, have the potential to pass through the area of analysis. The development of future projects could require the routes of recreational boaters, sightseeing boats, wildlife watching boats, and boat races to be adjusted. The adverse impact to

recreational boating would be minor and limited as the majority of documented routes by recreational boaters occur closer to shore.

Future offshore wind projects would lead to additional cable protection and scour protection located on the ocean floor. Lessees of future projects would need to continue to work with both the USCG and NOAA to ensure that recreational vessel users have up-to-date information regarding the location of these structures. Cable protection can make it so that anchors could become stuck on the hard structures and lost or create difficulty in holding in place. Future offshore WTGs would be installed in water depths where anchoring is uncommon, but there is the potential for impacts to recreational users to have higher anchoring risk in the areas where export cables are located closer to shore. The adverse impacts from anchoring would be minor, localized, continuous, and would last for the duration of the time that the project remains installed.

In-water structures from offshore wind development may overlap with fisheries that target highly migratory fish species located further offshore. The presence of structures could inhibit some mobile methods used to target highly migratory species, including trolling and drifting, as it would be more challenging for the recreational user to avoid the presence of the in-water structures. Despite these challenges, the in-water structures serve as artificial reefs and shelter for fish, making them attractive sites for the recreational fishing industry (Webster and Porter 2020). At the Block Island Wind Farm, fishermen have noted that the site has been incredibly popular, resulting in issues with fishing pressure, vessel crowding, and an increased risk of allision (Webster and Porter 2020). Future offshore wind development could provide attractive sites for recreational fishermen and spread fishing pressure. The artificial habitat provided by these structures could lead to an increase in the amount of target species present near offshore wind facilities and could have minor, positive effects on recreational fishing.

In-water structures of future offshore wind projects could provide new opportunities for offshore tourism. The Block Island Wind Farm has led to the creation of tours to allow for interested tourists to travel out to the Project, and similar tours could be established for future offshore wind projects (Block Island Ferry 2022). There could result in additional opportunities associated with recreational fishing and wildlife watching. The structures could attract species targeted for recreational fishing, leading to more recreational fishing vessels traveling offshore to fish near the WTGs and offshore substations/converter stations. The in-water structures may also lead to higher densities of seals, odontocetes, and sea turtles that would forage near the structures. This could create negligible, beneficial impacts to recreation and tourism, but the benefits would likely decline with distance from shore, as recreational vessels would likely not travel to projects located further away from the coast.

In-water structures would be the most visible part of future offshore wind projects. The presence of these structures on the offshore horizon would differ from the ocean's water surface and the visual horizon. The color of the turbines would contrast with sun angles throughout the day, and the motion of the WTGs for generation would draw attention from recreational users and tourists within the viewshed. The visual dominance of the WTGs would be influenced by a variety of factors, with the most significant being the distance between the WTGs and the viewing location. A survey-based study found that the net effect, considering the difference between respondents reporting the presence of turbines (of approximately 574 ft [175 m] in height) would make their experience worse and better, was at 12.5 mi (19.6 km) the net effect is 7 percent worse, at 15 mi (24.1 km) the net effect is zero, and at 20 mi (32.2

km) it is 7 percent better (Parsons and Firestone 2018). As described above, the southern shores of Martha's Vineyard and the western shores of Nantucket have little development and high value for tourism, scenic, historic, and recreational qualities. Future offshore wind development would result in WTGs that could be visible from shorelines, adding a developed/industrial visual element to the viewshed that previously was characterized by open ocean with periodic aircraft and transient vessels. This change in the viewshed would have negligible to moderate adverse impacts on visual resources depending on the location due to the introduction of industrial elements into an area that previously did not have development. Visual impacts would be long-term, continuous, and negligible to major adverse to recreation and tourism. See Section 3.22, *Scenic and Visual Resources,* for a more detailed discussion regarding potential impacts to Visual Resources. There is the possibility that some areas with the most direct viewsheds of the WTGs and other in-water structures could have some reductions in recreational and tourism activities, but it is not anticipated that there would be overall reductions in recreation and tourism in the GAA.

Noise: Noise from planned future projects could have adverse impacts on recreation and tourism by disrupting the natural sounds of the marine environment. Offshore noise that could impact recreation and tourism includes noise from G&G survey activities, pile driving, trenching, and construction-related vessel noise. Pile driving is anticipated to be the activity that would have the loudest noise associated with construction activities. Noise associated with this should not be audible from onshore locations, as the majority of pile-driving activities would occur a sufficient distance away from shore. Noise could be audible to some offshore boaters and recreational fishers, and cause for them to avoid areas where they are occurring. However, the loudest noises would come from within the safety zones that would be expected to be established by offshore wind developers and USCG, meaning that very few recreational users would be in the vicinity of the loudest sound levels from pile-driving activities. The safety zones are anticipated to be 500-yards around each WTG, OCS-DC, and cable while under construction based on the size of safety zones that have been established during previous offshore wind farm construction activities. However, the size of the safety zone could be different for the SRWF. Pile-driving activities would be anticipated to reach airborne sound levels of 60 dBA at a distance of 2,400 ft (731.5 m) (COP , Appendix I3; Stantec 2022), comparable to a vacuum cleaner at 9.8 ft (3.0 m) or normal conversation at 3.3 ft (1.0 m) (FHWA 2018). FHWA data and the distance of future offshore wind farms from the shoreline, suggests that noise from pile driving of future projects would not be expected to have adverse impacts on sound levels to recreation and tourism activities occurring on land or near the coastline. Noise from pile driving would be produced periodically throughout construction and could be amplified if construction was occurring at more than one project at the same time. Sound levels from pile driving activities would not be expected to have adverse impacts to human health or wellness but may present inconveniences to recreational boaters.

Noise from construction activities could have short-term, localized adverse impacts to fish species that are sensitive to underwater sound, driving fish away from the construction site, thus impacting recreational fishing in the vicinity of future offshore wind projects. As is discussed when describing IPFs associated with in-water structures, recreational fishing targeting highly migratory species would have a greater potential to be impacted, as fishing efforts occur further offshore and closer to where construction of future offshore wind projects would take place. Marine mammals, primarily whales, may be deterred from construction areas due to noise, resulting in adverse impacts on offshore wildlife

watching. Section 3.11, *Marine Mammals*, further describes potential impacts on marine mammals, and as noted, BMPs can minimize exposure. Operational noise from WTGs should not impact recreational fishing or offshore wildlife watching as the amount of noise produced should have little effect on fish and marine mammals. Construction activities would result in short-term, localized minor short-term adverse impacts to offshore wildlife watching and recreational fishing activities, but with BMPs employed, no long-term adverse impacts would be expected.

During normal operations, WTG operation would generate continuous noise, with sound pressure levels at or below ambient levels at relatively short distances from WTG foundations (Kraus et al. 2016). Noise levels measured during normal operations at the Block Island Wind Farm at the WTG base at 164 ft (50 m) minimally exceeded ambient noise levels. As wind speeds increase, the correlated increase in noise of the WTGs becomes less detectable due to the increase in ambient noise. During field observations, it was also determined that WTG operational noise was not detectable from the shore from Block Island Wind Farm operations (HDR 2019). Noise associated with maintenance operations could result in short-term, localized adverse impacts to recreation and tourism.

Noise from onshore construction activities would be short-term but could have adverse impacts to nearby recreation or tourism areas as the noise could be disruptive. Noise producing activities of onshore construction would include the cable installation at the landfall sites. Adverse impacts of onshore noise would be negligible, short-term and localized and would be expected to occur in previously developed areas. The impact level would depend upon the project type and the distance from the recreation and tourism site but would range from negligible to minor.

New cable emplacement and maintenance: Within the GAA, there is the potential of seabed disturbance up to 7,783 ac (31.5 km^2) for the export cable and 9,565 ac (38.7 km^2) for the IAC for other future offshore wind projects between 2022 and 2030. The installation of offshore cable emplacement would create localized, short-term adverse to recreational boating due to noise of installation and the need to navigate around work areas. Cable installation could also have short-term minor adverse impacts on recreational fishing, as targeted fish and invertebrates may be disturbed due to the required dredging, turbulence, disturbance, and turbidity. After installation has occurred, recreational boating would be impacted by cables only during maintenance operations and if they are not properly noted on charts, operators could lose anchors as the hard-bottom areas could make anchoring more difficult. Risks associated with anchoring would be minimal, as recreational vessels do not commonly anchor in the water depths where offshore structures would be installed. Impacts of cable emplacement on recreation and tourism would be negligible to minor, short-term, localized, and adverse.

3.21.3.3 Conclusions

Impacts of the No Action Alternative

Under the No Action Alternative, recreation and tourism would continue to be affected by existing environmental trends and ongoing activities. Recreation and tourism in the GAA would continue to be affected by ongoing activities, including vessel traffic, noise and trenching from periodic maintenance or installation of coastal and nearshore infrastructure, and onshore development activities. These activities would lead to periodic disruptions to recreation and tourism activities but would not significantly impact

recreation and tourism as they are a typical part of daily life along the coast in the GAA. Overall, the No Action Alternative would result in **moderate** adverse and **minor beneficial** impacts.

Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, existing environmental trends and ongoing activities would continue, and recreation and tourism would continue to be affected by IPFs associated with those activities. Planned non-offshore wind activities that could affect recreation and tourism include the installation of undersea transmission lines, gas pipelines, and other submarine cables, marine minerals use and ocean-dredged material disposal, military uses, dredging activities, and port improvements, through primary IPFs of vessel traffic, noise, and cable installation. Planned activities would have short-term, localized adverse impacts, but would not impact the area's scenic quality. Adverse impacts would result primarily from changes in the viewshed from undeveloped to having industrialized structures present and impacts associated with marine construction activities, including noise, lighting, and traffic. Beneficial impacts to recreation and tourism would come from increased sightseeing opportunities and the potential for improvements to recreational fishing from the presence of in-water structures. It is anticipated that recreation and tourism activities would continue to occur in the GAA with or without future offshore wind projects. BOEM anticipates that the cumulative impacts of the No Action Alternative would likely be **moderate** adverse and **minor beneficial**.

The impacts associated with future offshore wind activities in the GAA, considered with other reasonably foreseeable activities, current activities, and environmental trends, would be **moderate** adverse effects if no other offshore wind farms are authorized. Most of the adverse impacts could be avoided with APMs, but some impacts would only be minimized with APMs in place. If other offshore wind farms are authorized, BOEM would anticipate **moderate** adverse impacts to recreation and tourism with **minor beneficial** impacts.

3.21.4 Relevant Design Parameters and Potential Variances in Impacts

This Final EIS analyzes the maximum-case scenario; any potential variances in the proposed Project build-out as defined in the PDE would result in impacts similar to or less than described in the sections below. The following proposed PDE parameters (Appendix C) would influence the magnitude of the impacts on recreation and tourism:

- The Project layout, including the number, type, height, and placement of the WTGs and OSS;
- The choice of location for port operations;
- The design of visibility lighting on in-water structures;
- The time of year that construction occurs both near the coast and onshore;
- The accessibility of Smith County Park and Fire Island National Seashore to recreation users during construction; and
- The accessibility for recreational boaters to the Project Area.

Variability of the proposed Project design exists as outlined in Appendix E. Below is a summary of potential variances in impacts:

- WTG number, size, location, and lighting. Visual impacts that could impact recreation and tourism would change depending upon the distance from the shore and the size of the turbines present.
- WTG arrangement. The arrangement of WTG arrays could have different impacts on navigational routes of recreational boaters and present different safety issues.
- Choice of location for port operations: Different ports have varying levels of recreational use both at the ports and in nearshore waters adjacent to the ports. The choice of port could change the level of impact to recreational boaters.
- Design of visibility of lighting: Visibility lighting design options would impact the nighttime visibility of WTGs to onshore communities depending upon the orientation and type of safety lighting.
- Time of construction: Recreation and tourism activities in the expanded ROI are centered around the summer months (Parsons and Firestone 2018). Impacts on recreation and tourism would be more significant if construction were to occur during the recreation and tourism season.
- Accessibility of public recreational resources: Some recreation and tourism activities occur year-round, and there is the potential for activities to occur that affect public access. Public access to Smith County Park would not be allowed during construction activities. Additionally, public access could be limited to specific areas of the Fire Island National Seashore. However, the level of this impact would be directly associated with the time of year that construction activities would occur.

Impacts to tourism and recreation would vary if the incremental contributions from the action differ. Impacts could be beneficial or adverse. The incremental differences between relevant design parameters would be similar, with impacts ranging from negligible to moderate adverse and minor beneficial. IPFs from lighting, noise, in-water infrastructure and traffic could be slightly modified depending upon the design parameters. Short-term impacts to recreational boaters related to traffic could be mitigated if construction activities were limited to being outside of the busy summer season, as recreation and tourism activities in the GAA are centered around the summer months (Parsons and Firestone 2018). It is important that communication around construction schedules occurs to help minimize adverse impacts of the Project. Construction schedule plays an important role in determining the impacts of the Project. Construction of the onshore facilities are proposed to occur in the offseason of tourism, helping to minimize potential adverse impacts. This would help minimize interference with public use at Smith Point County Park and Fire Island National Seashore by allowing for use to occur during busy season. Additionally, establishing restriction zones would influence the potential impacts of the Project. If the general public no longer had access to recreational resources, impacts would be greater.

The number of WTGs could change the incremental impacts associated with recreation and tourism. If WTGs with higher capacities were installed, it would result in less WTGs overall. This would lead to less adverse impacts on traffic and boating, as navigating would be easier through less WTGs, but would lead to greater adverse impacts to the viewshed as the WTGs would be more prominent and seen from a further distance away. As such, the incremental differences would change, but the overall impact would remain the same.

The choice of port for O&M activities could have implications in the long-term, continuous impacts of the SRWF on recreation and tourism. The choice of a port that is more industrialized in nature would result in less impacts to tourism and recreation.

3.21.5 Impacts of Alternative B – Proposed Action on Recreation and Tourism

3.21.5.1 Construction and Installation

The construction of the SRWF could result in potential onshore and offshore impacts to recreation and tourism from vessel traffic, visible infrastructure, noise, and lighting and marking. The Proposed Action would have long-term, minor adverse impacts on recreation and tourism in the geographic area due to the presence of up to 94 11-MW WTGs within 102 potential positions. The WTGs would impact visual resources within the viewshed of coastal locations and would create potential impacts due to increased safety risks within the area where WTGs are present. The Proposed Action would also have long-term minor beneficial impacts to recreation and tourism from the presence of in-water structures both creating artificial habitat that would lead to increased fish aggregation and improving recreational fishing opportunities and creating the potential for increased opportunities for sightseeing. There would be short-term minor impacts associated with increased vessel traffic, noise, and lighting from construction and decommissioning activities of the Proposed Action.

3.21.5.1.1 Onshore Activities and Facilities

Anchoring: Anchoring activities would not impact onshore activities and facilities related to recreation and tourism. Impacts to offshore activities and facilities during construction activities are discussed below.

Noise: Noise from construction activities and the potential for recreational users and tourists to have workers, equipment, vehicles, debris, or cleared areas in their GAA could have short-term, short-term adverse impacts on recreation and tourism near the landfall site at Smith Point County Park, a public beach access point within the Fire Island National Seashore, and adjacent to the federally designated Otis Pike Wilderness Area. Noise from construction activities would also be expected to have adverse impacts on recreation and tourism in areas utilized by the public adjacent to construction activities, including the TWA Flight 800 International Memorial, the Fire Island Wilderness Center, Southaven County Park, Wertheim NWR, and the Brookhaven Fairgrounds. Sunrise Wind has proposed to implement an APM that the construction of the Landfall and ICW HDD would be 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 would be designed to minimize impacts to local communities, and thus recreation and tourism, the extent feasible. If implemented, this would help lessen impacts to recreation and tourism, as two-thirds of tourism activities occur within the summer season, from Memorial Day to Labor Day, but impacts would still occur. The Fire Island National Seashore is open year-round to visitors. Visitors would be expected to be present in areas adjacent to construction activities and would be adversely impacted from construction noise. BMPs to mitigate impacts from noise are identified in Appendix H and would help lessen impacts to visitors in adjacent areas. Impacts from noise would be short-term and range from minor to moderate for onshore recreation and tourism activities.

Land Disturbance: The onshore transmission cable route has, to the extent practical, been sited within existing disturbed ROW, with the intent to minimize changes to the view and nature of surrounding facilities. Within the public ROW, the onshore transmission cable portion of the Project corridor consists

of the full extent of the ROW, and during construction, would typically require a temporary disturbance width of up to 30 ft (9 m), excluding disturbance areas for trenchless crossing locations and splice vaults. The onshore transmission cable route is sited to cross under the William Floyd Parkway to a recreational area located to the west of William Floyd Parkway. The onshore transmission cable would be installed via HDD below the Carmans River, in the vicinity of a segment that is a NYS designated Recreational River. The Project's HDDs are described in detail in the HDD Work Plan, provided as Appendix NN of the EM&CP 2. During construction activities, access to this recreational resource would be limited. There would be short-term, minor adverse impacts to recreational users of this area, as opportunities may be limited during the construction period.

The construction of the Landfall and ICW HDD is expected to occur over a three to four-month period outside of the peak summer tourist season to minimize impacts to recreation and tourism. Construction would result in short-term reductions in facilities that provide access to recreational areas, including those at Smith Point County Park, Fire Island National Seashore, Fire Island Wilderness Visitor Center, Otis Pike Wilderness Area, Smith Point Marina, the TWA Flight 800 International Memorial, Wertheim NWR, Southaven County Park, and Brookhaven Fair Grounds. This would have short-term, localized impacts to both onshore recreation and tourism activities and recreation and tourism activities that occur along the coast in the proposed construction area, including swimming, surfing, scuba diving, and recreational fishing. Landfall HDD construction would be anticipated to occur over three to four months, with the construction schedule for the remaining onshore facilities designed to the best extent possible to minimize impacts to local communities and local recreation and tourism activities. Sunrise Wind has committed to maintaining public access to all facilities at Smith Point County Park and Smith Point Marina unless temporarily necessary for safety purposes, allowing for recreation actions to continue to occur in the surrounding area both onshore and in the water. Sunrise would develop a plan for access in parkland and open space such that the Project would not hinder the use of recreational uses or reduce existing parking areas below what is needed to accommodate seasonal use, as is identified in New York's Certificate of Environmental Compatibility and Need issued on November 18, 2022, to minimize impacts to recreation opportunities to the extent practical. Construction staging areas would be located, to the extent possible, so that public parking, beach access, access to recreational facilities, and access to campsites would be maintained. Sunrise Wind has proposed an APM to minimize impacts to recreation and tourism that unless otherwise necessary for safety purposes, where disruptions would be short-term and infrequent, lasting minutes. Sunrise Wind would 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. Impacts from onshore construction would be minor to moderate, short-term and would occur during times when recreation and tourism are not as busy in the area.

Port utilization: Sunrise Wind is investigating existing facilities in New York, Connecticut, Massachusetts, Maryland, New Jersey, Rhode Island, and Virginia for potential use for staging, construction, and/or for O&M purposes. The proposed locations are all existing industrial ports, which would result in minimal impacts to recreation and tourism. A BOEM study has found that recreation and tourism should not experience long-term, significant impacts at existing ports centered around marine industrial activities with or without offshore wind development (BOEM 2016). Sunrise Wind would consider potential

impacts to recreation and tourism when selecting the port that would be utilized for O&M. Impacts from port utilization to recreation and tourism would be negligible.

Presence of structures: The interconnection facility in Brookhaven is proposed in close proximity to the existing Holbrook substation and is located in an already developed area that is zoned for commercial and utility use. Onshore construction and installation would result in the incremental additions of an O&M facility, an interconnection facility, and distribution cable. The locations of these onshore structures are already developed, and commercial/industrial in nature, but recreation users may be sensitive to the changes in the view from construction impacts. This would not result in long-term adverse visual impacts to recreational users. Sunrise Wind has proposed to maintain public access to all facilities at Smith Point County Park and Smith Point Marina, unless temporarily necessary for safety purposes, which, if necessary, would result in minor, short-term impacts. During Landfall HDD and ICW HDD, a temporary landing structure would be installed to aid in the offloading of equipment and materials. The temporary landing structure would be installed within the Narrow Bay/Long Island ICW to support the transport of heavy construction materials to ocean-side export cable landing site at Smith Point County Park. The landing structure would be approximately 16 ft wide by 242 ft long and secured to the seabed by approximately 21 steel piles, each measuring 16 inches in diameter. The landing structure may need to remain in place year-round, but the use would be limited to fall and spring. Visual impacts from construction activities are further discussed in Section 3.22.5. Onshore recreation and tourism would have short-term, minor adverse impacts from the presence of structures during construction activities, as public access would remain in recreation areas to the extent feasible while allowing for safe construction. However, these impacts would be short-term and only last during the duration of construction activities.

Traffic: Recreation and tourism users along the Long Island Expressway and Route 97 may experience delays from onshore SRWF construction activities occurring along or adjacent to the roadways. Roadways or short-term lane closures may need to occur during construction activities, resulting in adverse impacts for local communities. Sunrise Wind has consulted with local entities including the Suffolk County Department of Public Works, the Town of Brookhaven Department of Public Works, and the NYSDOT regarding route location, traffic management, construction methodology, and time of year considerations (COP Section 4.8.2.2; Sunrise Wind 2023). In addition, as required by NYS law, Sunrise Wind would implement an APM by developing an MPT Plan to minimize potential traffic impacts during construction. The MPT Plan would be submitted to the New York Department of Public Service for review and approval during the Article VII review process (COP Section 4.8.2.2; Sunrise Wind 2023). Additionally, Sunrise Wind would coordinate, to the extent practicable, onshore construction activities to occur outside of the busy summer tourism season, implementing another APM to help minimize impacts to recreation and tourism activities at Smith County Park, the Fire Island National Seashore, and Otis Pike Wilderness Area. Construction vehicles would add short-term, adverse minor to moderate impacts from traffic delays on local roadways, as well as short-term, adverse light, noise, and traffic and parking limitations at the Smith Point County Park landfall site, which provides parking for Smith Point County Park and the adjacent Fire Island National Seashore and Otis Pike Wilderness Area. However, Sunrise Wind has committed to maintaining public access to all facilities at Smith Point County Park and Smith Point Marina, including roadways and parking lots, unless temporarily necessary for safety purposes. Traffic related to construction activities would impact other recreation and tourism areas from

disruptions to parking during construction activities and changes to traffic flow. This would have indirect impacts to recreation and tourism areas adjacent to construction activities, as well as recreation and tourism areas where construction is occurring, including but not limited to the Fire Island National Seashore, Otis Pike Wilderness, Fire Island Wilderness Center, Smith Point County Park, the TWA Flight 800 International Memorial, Southaven County Park, Wertheim NWR, and the Brookhaven Fair Grounds. Construction activities would occur along existing roadways, which would include short-term disruptions to parking and traffic flow along the construction route. Traffic would result in minor to moderate impacts to recreation and tourism, which would be short-term, lasting the duration of construction activities, and localized.

Conclusion: The construction of onshore facilities would also result in short-term, minor to moderate adverse impacts to recreation and tourism as a result of increased visible infrastructure, traffic, lighting, land disturbance, and noise.

3.21.5.1.2 Offshore Activities and Facilities

During construction, tourism and recreational offshore uses including boating, fishing, wildlife watching, scuba diving, and sightseeing could experience minor to moderate adverse impacts. Construction activities would lead to boating traffic, construction noise, visual impacts, and changes in public safety requirements for recreational boaters. Construction impacts from the SRWEC could be more significant than the construction of the WTGs as construction activities occur closer to shore. Regardless of location, construction activity would be short-term and transient, having limited short-term potential impacts.

Appendix H (*Mitigation and Monitoring*) describes APMs that would be implemented to mitigate risks to offshore recreation and tourism from construction activities, including but not limited to; scheduling onshore construction at the Smith Point County Park, located in the Fire Island National Seashore and adjacent to the Otis Pike Wilderness Area, outside of the busy tourism season; communication plans with boaters and offshore recreation activities; choice of port; and timing of construction activities. The Smith Point County Park landfall location was chosen in part to help minimize interactions with recreational boating activity in the region and to minimize interactions with mapped shipwrecks viewed by scuba divers.

Anchoring: Anchoring during construction activities related to the Proposed Action would affect recreation and tourism activities in the region by creating an inconvenience to navigation by recreational vessels that must operate around anchored vessels and by contributing to the disturbance of marine species that are important to recreational fishing and wildlife viewing activities. BOEM anticipates that the USCG may establish short-term safety zones around offshore wind construction areas, which would minimize impacts from anchored construction vessels to recreational boaters. Vessel anchoring related to construction of the Proposed Action would have localized, short-term, minor impacts on recreation and tourism due to the navigational challenges it creates for recreational boaters and the disturbance of species important to recreational fishing and wildlife viewing.

Noise: Offshore construction activities of both the SRWF and SRWEC would result in increased noise levels that would have short-term, localized impacts to some fish species, marine mammals, and other marine animals. Fish species avoiding construction areas could result in adverse impacts to recreational

fishing in these areas (see Section 3.14 for further discussion of impacts to fisheries). If marine mammals and other marine species, such as sea turtles, avoid construction sites, there would be adverse impacts to offshore wildlife watching recreation (see Sections 3.11 and 3.12 for further discussion of Marine Mammals and Sea Turtles, respectively). Sunrise Wind would implement BMPs during construction to help minimize sound exposure and mitigate these adverse impacts. Increased noise levels could also be a nuisance to recreational boaters near offshore construction areas. However, with the safety zone in place, it is unlikely that boats would be traveling close enough to the construction area to result in significant adverse impacts. The safety zones are anticipated to be 500-yards around each WTG, OCS-DC, and cable while under construction based on the size of safety zones that have been established during previous offshore wind farm construction activities. However, the size of the safety zone could be different for the SRWF. Accordingly, offshore construction noise impacts should be short-term and result in minor adverse impacts to recreation and tourism.

Lighting: When nighttime construction activities occur, lighting would be necessary. However, onshore construction activities are anticipated to occur primarily within areas that are industrial or developed in nature. Project-related construction vessels and in-water equipment for both the WTGs and OCS-DC require USCG-approved navigation lighting so that they are visible to other vessels. Depending upon atmospheric conditions and location onshore, lights may be visible. The majority of recreation and tourism activities occur in the daylight, so adverse impacts from lighting would be negligible, limited and short-term.

Presence of structures: While offshore construction of both the SRWF and SRWEC are occurring, it is likely that construction vessels erecting structures would be visible from some onshore recreation and tourism resources in the GAA. These visual impacts would be limited due to the distance of the offshore construction area from the coast, and short-term for the duration of construction activities. Impacts from visual resources would increase as the distance between recreation and tourism activities becomes closer to the construction activities. Therefore, the visual impacts on offshore recreational users during construction activities are anticipated to be greater due to the closer proximity of these activities. Offshore construction activities could have adverse impacts on viewers who expect to see a pristine, undeveloped ocean landscape, or beneficial impacts on viewers who see the construction and renewable energy development as a positive activity. The preference of the viewer is an important feature in determining the visual impact on recreation and tourism activities. However, changes in the viewshed could have adverse impacts from specific viewpoints or recreational areas but are not expected to have adverse impacts to recreation and tourism in the region as a whole. Visual impacts from construction are expected to be short-term and limited. Visual impacts from the proposed construction of the Project are further discussed in Section 3.22.5. Impacts to recreation and tourism as a result of offshore construction activities would be moderate adverse and short-term.

Traffic: Offshore construction would increase vessel traffic in the GAA, but over half of recreational boating occurs within 1-mile of the shore, with few routes occurring in the proposed SRWF location (SeaPlan 2013). Construction could impact long-distance boat sailing races, potentially causing the need for routes to be shifted. Sailboat, distance, and buoy races in or near Rhode Island Sound and Block Island Sound can be found in COP Table 4.7.3-1 (Sunrise Wind 2023), and Sailboat, Distance, and Buoy Races in or Near Long Island Bays and the Atlantic Ocean can be found in COP Table 4.7.3-2 (Sunrise Wind 2023). Construction could impact the navigation of smaller recreational vessels. Safety zones

designed in conjunction with the USCG during construction could alter the routes of recreational boaters during the period of offshore construction activities. The safety zones are anticipated to be 500-yards around each WTG, OCS-DC, and cable while under construction based on the size of safety zones that have been established during previous offshore wind farm construction activities. However, the size of the safety zone could be different for the SRWF. Sunrise Wind would also implement a communication plan to inform vessels of construction activities, vessel movements, and how construction activities may affect this area to help reduce adverse impacts to tourism and recreation. Agency and stakeholder outreach would continue to occur throughout the project construction period (COP Table 1.5-1; Sunrise Wind 2023) and the implementation of a fisheries communication plan would help to minimize impacts to recreational activities (COP Appendix B: Fisheries Communication Plan; Ørsted Offshore North America 2021). With these measures implemented, offshore construction of the SRWF is expected to result in limited, short-term, minor adverse impacts to vessel traffic and navigation routes.

3.21.5.2 Operations and Maintenance

3.21.5.2.1 Onshore Activities and Facilities

O&M activities of onshore facilities would result in negligible, variable adverse impacts to recreation and tourism over the lifespan of the Project. O&M activities would be periodic and short-term. The underground onshore transmission cable and onshore interconnection cable would not require maintenance unless there was a failure or malfunction. The OnCS-DC would be located in previously developed, industrial area that has an existing substation, helping minimize the impacts to recreation and tourism as industrial and commercial activity would be expected to occur in the areas where Onshore facilities are located. Limited equipment would be visible at Onshore facilities, and yard lighting at Onshore facilities would be minimal and subject to state and local requirements. O&M of Onshore facilities should result in negligible adverse impacts to recreation and tourism.

O&M would affect onshore recreation and tourism by changing the visual character of the viewshed. Normal operations of the Project would have visible infrastructure in the water and could change the scenic quality for onshore recreation and tourist activities. Impacts to onshore recreation would be lessened as the distance from the Project facilities increases. Visual impacts are further described in Section 3.22.5. O&M of Onshore activities and facilities would have permanent, minor adverse impacts to recreation and tourism.

3.21.5.2.2 Offshore Activities and Facilities

Anchoring: Anchoring during O&M activities would be expected to have less impacts than during construction and decommissioning because there would be less anchored vessels present in the proposed Project Area. Anchored vessels would create navigational challenges for recreational boaters and would disturb wildlife important for recreational fishing and wildlife viewing. However, there would be less anchored vessels present, which would lessen the impacts on recreation and tourism activities. Vessel anchoring during O&M activities would result in impacts ranging from negligible to minor, depending upon the number of vessels present.

Noise: Noise from O&M activities could result in impacts on recreation and tourism. Impacts on recreation and tourism would result along the SRWF and offshore export cable route. Noise would be short-term, and only would occur when some O&M activities are occurring. Depending upon the level of noise, recreation users could have adverse impacts from sounds. Noise from O&M activities would result in short-term, negligible to minor impacts to recreation and tourism.

Lighting: The WTGs associated with the Proposed Action would be equipped with USCG navigation warning lights and aviation obstruction lights as a safety feature to reduce the risk of allision. Impacts to recreation and tourism would depend upon the distance of users from the SRWF, visibility of the SRWF from the location, and the existing visual quality surrounding the SRWF. Additional lighting in the offshore environment could affect tourists and recreational users who are accustomed to experiencing dark nighttime skies. In many places, offshore lighting visibility would be limited due to existing offshore light sources, shoreline light sources, and the distance of the SRWF from the viewer. Sunrise Wind is proposing to implement ADLS on WTGs and comply with any other USCG requirements while minimizing visibility from shore as an APM to minimize impacts from lighting. ADLS would reduce the duration of potential impacts of nighttime aviation lighting to less than 1 percent of the normal operation time that would occur without using ADLS. Offshore recreational activities are limited at nighttime, so the majority of impacts would occur to onshore viewers. Impacts from offshore lighting would be dependent upon the location of the viewer in comparison to the SRWF, but would likely be negligible due to the vast majority of recreation and tourism activities that occur at night happening onshore.

Port utilization: O&M activities would occur at existing port facilities where recreational activities are not expected to occur. However, recreational boating could be impacted in the surrounding region as there would be an increase in vessel traffic moving from the port to areas that would need O&M activities. Port activities would follow any federal, state, and local regulatory guidelines to minimize adverse impacts to recreation and tourism activities in the nearby areas. Therefore, the Proposed Action is anticipated to result in negligible impacts on port utilization.

Presence of structures: Offshore infrastructure, particularly up to 94 11-MW WTGs, have the potential to be visible from the shoreline to a limited number of communities in the GAA. The upper blade tip height would be up to 787 ft (240 m) above mean sea level (AMSL) per the PDE, which would be a significant change to the current viewshed of the undeveloped, open ocean. Recreation and tourist activities could be affected by changes in the viewshed, particularly from undeveloped viewpoints. Recreation activities occur along beaches, bluffs, dunes, open fields, and residential yards that have unobstructed ocean views, and recreational users could experience adverse impacts from the changes in the viewshed if their preference is to have undeveloped open ocean views. The University of Delaware completed a study to evaluate potential impacts of visible offshore WTGs with a rotor diameter of 492 ft (150 m) so that when a blade was at the apex the turbine was 574 ft high (175 m), on beach use. At 15 mi (24.1 km), 68 percent of respondents answered that the WTGs would not improve or worsen their experience, 16 percent answered that the WTGs would improve their beach experience, and 16 percent answered that the WTGs would worsen their beach experience (Parsons and Firestone 2018). Therefore, there is the potential for a range of negligible to moderate beneficial and adverse impacts of the visibility of the WTGs on recreation and tourism activities and experiences. Further discussion on potential visual impacts from the Proposed Action are discussed in Section 3.22.5.

Operation of the SRWF could have the potential for positive effects to recreation and tourism. There is the potential for wind farm related sightseeing and tourism activities, similar to offshore tours of the Block Island Wind Farm (Block Island Ferry 2022). The presence of in-water structures could also act as artificial reef habitat and shelter for fish, providing benefits to the recreational fishing industry (Webster and Porter 2020). The increased number of fish have the potential to result in other benefits to recreation and tourism, as there could be wildlife watching opportunities for species that would forage on the fish, or potential for additional scuba diving opportunities to view the wildlife near the WTGs. The in-water infrastructure could result in potential beneficial impacts related to changes to the natural resources.

Cox Ledge has been identified as one of the most popular recreation fishing spots in Southern New England (Kneebone and Capizzano 2020). Project infrastructure overlapping with the complex habitat in this region could potentially adversely impact cod and its spawning habitat (see Section 3.10 *Finfish, Invertebrate, and EFH* and Section 3.14 *Commercial Fisheries and For-hire Recreational Fishing* for more details). Recreational fishers are permitted to catch up to 10 cod per day in this area (NOAA 2021). However, at this distance offshore, recreational fishing predominantly targets highly migratory species like bluefin tuna (*Thunnus thynnus*) and mahi mahi (*Coryphaena hippurus)* (Kneebone and Capizzano 2020). Therefore, it is not expected that the Proposed Action would have significant impacts on the recreational fishing of cod.

Traffic: O&M of offshore Project facilities would result in restricted recreational boat traffic around the SRWF through permanent navigation exclusion areas. Safety zones, that are anticipated to be 500-yards around each WTG, OCS-DC, and cable while under construction based on the size of safety zones that have been established during previous offshore wind farm construction activities, may be established during O&M activities, resulting in limited, short-term disruptions for recreation and tourism activities that occur in close proximity to the SRWF. Sunrise Wind would maintain communication methods to help minimize adverse impacts related to recreational boating traffic. A summary of anticipated routine maintenance activities and the regularity at which they are expected to occur can be found in COP Table 3.5.2-1, Table 3.5.3-1, and Table 3.5.4-1 (Sunrise Wind 2023).

Vessel traffic associated with O&M of the SRWF and SRWEC would be less than during construction activities, but still would result in an increase in vessel traffic in the GAA. It is not anticipated that maintenance would be needed for the SRWEC unless there is fault or failure of Project facilities. Depending upon the location of the necessary maintenance, O&M activities may transect routes used for distance sailing races or recreational boating, and could result in short-term, limited effects to recreation and tourism. For typical O&M activities, it is anticipated that smaller vessels would be used than those needed for construction-related activities. However, the type and number of vessels would vary depending upon the required work. Helicopters may also be used during O&M activities. Operation of vessels and helicopters could result in noise impacts to recreation and tourism activities. These impacts would decrease as the distance away from O&M increases. The increase in vessel traffic and potential changes in routes could result in minor, long-term adverse impacts to recreation and tourism.

3.21.5.3 Conceptual Decommissioning

3.21.5.3.1 Onshore Activities and Facilities

Conceptual decommissioning would have similar, short-term minor and moderate adverse impacts to recreation and tourism as described under construction. The same APMs, including developing an MPT Plan, would be implemented to limit adverse effects to traffic and onshore construction occurring outside of the summer season.

3.21.5.3.2 Offshore Activities and Facilities

Recreational boaters would experience similar short-term, minor to moderate adverse impacts from conceptual decommissioning of offshore Project components and offshore Project construction. Sunrise Wind would implement the same APMs for conceptual decommissioning as they propose for construction. This would include a comprehensive communication plan with outreach to stakeholders in the offshore recreation and tourism industry to help minimize adverse impacts.

3.21.5.4 Cumulative Impacts of the Proposed Action

The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned activities. The cumulative impacts of the Proposed Action considered the impacts of the Proposed Action in combination with other ongoing and planned wind activities. Ongoing and planned non-offshore wind activities related to the installation of undersea transmission lines, gas pipeline, and other submarine cables, marine mineral use, ocean-dredged material disposal, military uses, dredging activities, and port improvements would contribute to impacts on recreation and tourism through the primary IPFs of vessel traffic, noise, lighting, and cable installation. The construction, O&M, and decommissioning of both onshore and offshore infrastructure for offshore wind activities across the GAA would also contribute to the primary IPFs of traffic, presence of structures, lighting, noise, anchoring, port utilization, and land disturbance. In context of reasonably foreseeable environmental trends, the Proposed Action would contribute incrementally to the cumulative IPFs and impacts on recreation and tourism. BOEM anticipates that the cumulative impacts of the Proposed Action would likely be minor to moderate adverse and minor beneficial.

Anchoring: The Proposed Action would contribute a noticeable increment to the cumulative anchoring impacts on recreational boating, which BOEM anticipates would be localized, short-term, minor impacts during construction and decommissioning of offshore wind projects in the GAA. When multiple offshore wind projects are under construction simultaneously in the recreation and tourism GAA, impacts could be moderate to recreation and tourism due to the increased amount of anchoring.

Noise: The Proposed Action would contribute a noticeable increment to the cumulative noise impacts on recreation activities. Impacts from noise on recreation and tourism would be anticipated to be short-term, localized and minor for offshore recreation and tourism activities and short-term, localized, and minor to moderate for onshore recreation and tourism activities.

Land disturbance: The Proposed Action would contribute a noticeable increment to the cumulative land disturbance impacts on recreation and tourism, with impacts that would be localized, short-term, and

moderate. The extent of land disturbance associated with other projects and impacts to recreation and tourism would depend upon the locations of landfall, onshore transmission cable routes, and onshore substations for other offshore wind energy projects.

Port utilization: The Proposed Action would result in negligible cumulative port utilization impacts on recreation and tourism.

Presence of structures: Structures from other planned offshore wind development would result in comparable impacts on recreation and tourism of the Proposed Action alone. The extent of the impacts would increase as additional offshore wind projects are constructed, but the level of impacts would likely be the same. Portions of the 94 WTGs from the Proposed Action combined with future offshore wind projects for a total of 1,038 WTGs in the GAA could potentially be visible from coastal and elevated locations in the GAA and contribute to impacts on recreation and tourism. Section 3.22, *Scenic and Visual Resources*, provides further discussion of the potential visibility of structures and impacts. The Proposed Action would contribute a noticeable increment to the cumulative impacts on recreation and tourism from ongoing and planned activities, which would result in moderate impacts.

Traffic: The Proposed Action would contribute a marginal increment to the cumulative vessel traffic impacts on marine recreation and tourism activities, which would likely be localized and minor to moderate during construction, and long-term and negligible to minor during operation. Overlapping construction schedules of offshore wind projects in the GAA would increase vessel traffic between ports and work areas, which would require for recreational or tourism-related boaters to be more alert and could result in minor adjustments to routes or activities.

The Proposed Action would contribute a noticeable increment to the cumulative vehicle traffic impacts on onshore recreation and tourism activities. The extent of vehicle traffic from other projects and impacts to recreation and tourism would depend upon the locations of landfall, onshore transmission cable routes, and onshore substations for other offshore wind energy projects. Vehicle traffic would be localized, short-term, and minor to moderate during construction activities.

Lighting: The Proposed Action would result in negligible cumulative lighting impacts on recreation and tourism.

3.21.5.5 Conclusions

Impacts of Proposed Action

BOEM anticipates the construction, operation and maintenance, and conceptual decommissioning of the Proposed Action would have **moderate** adverse and **minor beneficial** impacts to recreation and tourism. Construction and decommissioning activities would result in increases in vehicle traffic, vessel anchoring, vessel traffic, noise, lighting, visible construction activities to recreational users and tourists, and land disturbance in areas used for recreation and tourism and construction areas adjacent or in close proximity to recreation and tourism areas. Impacts to recreation and tourism from port utilization and lighting during construction activities would be negligible. Impacts from noise, onshore traffic, offshore traffic, and anchoring would be minor. Impacts to recreation and tourism from land disturbance, offshore traffic, and the presence of structures during construction activities would range from **minor** to

moderate adverse. These activities would result in short-term adverse impacts to recreation and tourism and would be partially mitigated by the proposed APMs. Project O&M would result in both short-term and long-term IPFs from vessel traffic, vessel anchoring noise, lighting, and visible infrastructure. The impacts of O&M activities associated with the Proposed Alternative would range from negligible to moderate adverse and minor beneficial impacts to recreation and tourism. Port utilization would have negligible impacts. During O&M activities, anchoring and noise would have negligible to minor impacts to recreation and tourism. Traffic would result in minor impacts and the presence of structures would result in minor beneficial to moderate adverse impacts. The overall effect of the Proposed Action on recreation and tourism would be expected to be **moderate** adverse and **minor beneficial** impacts, as recreation and tourism activities are expected to continue with most impacts being avoided with APMs in place.

Cumulative Impacts of the Proposed Action

BOEM anticipates that the cumulative impacts on recreation and tourism in the GAA would be **moderate** adverse with **minor beneficial** impacts. In the context of reasonably foreseeable environmental trends, the incremental impacts contributed by the Proposed Action would be marginal. Short-term impacts from construction and conceptual decommissioning activities would include noise, lighting, anchored vessels, and changes in navigational routes. Long-term impacts include the presence of visible infrastructure in the GAA during operations impacting the visual quality of the area, the presence of buried cable structures impacting anchoring, and changes to vessel navigation to avoid allision. Beneficial impacts would result from offshore wind farm sightseeing opportunities and from the potential reef effect and shelter that the infrastructure would provide. The majority of the impacts to recreation and tourism from the Proposed Action could be avoided with APMs in place.

3.21.6 Alternative C-1 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions

3.21.6.1 Construction and Installation

3.21.6.1.1 Onshore Activities and Facilities

Alternative C-1 would not affect the Project's onshore facilities and activities. Alternative C-1 would also not change construction activities that could impact onshore activities. There would be similar levels of noise, lighting, and visible construction equipment, and impacts to traffic for onshore activities when compared to the Proposed Action. Therefore, direct and indirect effects to onshore recreation and tourism would be the same as the Proposed Action. Impacts would be adverse and short-term and would be expected to range from negligible to moderate adverse impacts to minor beneficial impacts.

3.21.6.1.2 Offshore Activities and Facilities

Impacts to offshore activities and facilities during construction would be similar to those described under the Proposed Action and would be negligible to moderate and short-term. Offshore construction activities would result in impacts to recreational boating, fishing, wildlife watching, scuba diving, and sightseeing. Traffic, noise, lighting, and visible infrastructures would be the IPFs that would affect

recreation and tourism associated with Alternative C-1. Under this alternative, sensitive benthic habitats would be avoided that may be important for recreational fishing activities. Impacts would be short-term and would be expected to range from negligible to moderate.

3.21.6.2 Operations and Maintenance

3.21.6.2.1 Onshore Activities and Facilities

Alternative C-1 would not affect the Project's onshore facilities and should result in very similar O&M needs as the Proposed Action. Therefore, impacts to onshore recreation and tourism would be the same as described under the Proposed Action. The impacts would be adverse long-term and range from negligible to moderate.

3.21.6.2.2 Offshore Activities and Facilities

O&M activities under Alternative C-1 to offshore facilities would be similar to those described under the Proposed Action. There would be potential impacts from noise, lighting, visible infrastructure, and traffic. However, Alternative C-1 involves removing 8 11-MW WTGs from Priority Areas 1, 2, 3, and/or 4 to minimize impacts to fisheries habitat. Depending on where the WTGs are removed from, there could be less impacts to recreation and tourism. For example, Cox Ledge has been identified as one of the most popular recreation fishing spots in Southern New England and protecting this complex habitat could help mitigate adverse impacts to cod in the region (Kneebone and Capizzano 2020). All other impacts are anticipated to be similar to those described under the Proposed Action and would range from negligible to moderate adverse impacts to minor beneficial impacts.

3.21.6.3 Conceptual Decommissioning

3.21.6.3.1 Onshore Activities and Facilities

The Fisheries Habitat Impact Minimization Alternative would not affect the Project's onshore facilities and activities. Alternative C-1 would also not change conceptual decommissioning activities that could impact onshore activities. There would be similar levels of noise, lighting, and visible construction equipment, and impacts to traffic for onshore activities. Therefore, direct and indirect effects to onshore recreation and tourism would be the same as the Proposed Action. Impacts would be short-term and would be expected to range from adverse negligible to moderate.

3.21.6.3.2 Offshore Activities and Facilities

Impacts to offshore activities and facilities during conceptual decommissioning would be similar to those described under the Proposed Action and would be adverse negligible to moderate and short-term. Offshore conceptual decommissioning activities would result in impacts to recreational boating, fishing, wildlife watching, scuba diving, and sightseeing. Traffic, noise, lighting, and visible infrastructures IPFs would affect recreation and tourism associated with Alternative C-1. Impacts would be short-term and would be expected to range from adverse negligible to moderate.

3.21.6.4 Cumulative Impacts of Alternative C-1

The cumulative impacts on recreation and tourism would likely be negligible to moderate adverse to minor beneficial. In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-1 and the cumulative impacts on recreation and tourism would be similar to those described under the Proposed Action.

3.21.6.5 Conclusions

Impacts of Alternative C-1

Alternative C-1 could result in reduced impacts to recreational fishing, as WTGs would be relocated from complex fish habitat. This could improve recreational experiences by helping protect fish species that are targeted by recreational fishing vessels. This area is part of cod spawning habitat, and recreational fishers are permitted to catch up to 10 cod per day in this area (NOAA 2021). However, at this distance offshore, recreational fishing predominantly targets highly migratory species (Kneebone and Capizzano 2020). Therefore, it is not expected that impacts would be significantly different from Alternative C-1 to the Proposed Action on recreation and tourism. As a result, BOEM expects that the impacts from Alternative C-1 to recreation and tourism would be similar, but potentially less, to the Proposed Action. All other impacts are anticipated to be similar to those described under the Proposed Action and would be **moderate** adverse with **minor beneficial** impacts.

Cumulative Impacts of Alternative C-1

In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-1 to the cumulative impacts on recreation and tourism would be marginal. BOEM anticipates that the cumulative impacts of Alternative C-1 would be **moderate** adverse impacts with **minor beneficial** impacts. This impact rating is driven by ongoing and planned activities as well as short-term and permanent disturbance associated with both onshore and offshore construction, O&M and decommissioning of the Alternative.

3.21.7 Alternative C-2 – Reduced Layout from Priority Areas via Exclusion of up to 8 WTG Positions and Relocation of up to 12 WTG Positions to the Eastern Side of the Lease Area

Alternative C-2 was developed to potentially reduce impacts to fisheries habitat within the Lease Area by removing up to 8 WTGs from Priority Areas 1, 2, 3, and/or 4 and relocating up to an additional 12 WTGs to currently unoccupied positions along the eastern side of the Lease Area. Under Alternative C-2, the 11-MW WTGs and OCS-DC would occur within the range of design parameters outlined in the COP.

3.21.7.1 Construction and Installation

3.21.7.1.1 Onshore Activities and Facilities

Impacts of Alternative C-2 to recreation and tourism resources during construction activities would be similar to those described under the Proposed Action. Impacts would be short-term and would be expected to range from negligible to moderate adverse impacts to minor beneficial impacts.

3.21.7.1.2 Offshore Activities and Facilities

Impacts of Alternative C-2 to recreation and tourism resources during construction activities from traffic, noise, lighting, and presence of structures would be similar to those described under the Proposed Action. Impacts would be short-term and would be expected to range from negligible to moderate.

3.21.7.2 Operations and Maintenance

3.21.7.2.1 Onshore Activities and Facilities

Impacts of Alternative C-2 to recreation and tourism resources from O&M activities of onshore facilities would be similar to those described under the Proposed Action. Impacts would be long-term and range from negligible to moderate.

3.21.7.2.2 Offshore Activities and Facilities

O&M activities under Alternative C-2 to offshore facilities would be similar to those described under the Proposed Action. Under Alternative C-2, up to 20 11-MW WTGs would be removed from Priority Areas 1, 2, 3, and/or 4 (up to 8 removed and 12 relocated). Up to 12 WTGs would be relocated to currently unoccupied positions along the eastern side of the Lease Area. Under Alternative C-2, the same number of WTGs would be installed, the same as under the Proposed Action. The different locations of the WTGs could result in less impacts to recreational fishing. For example, Cox Ledge has been identified as one of the most popular recreation fishing spots in Southern New England, and protecting this complex habitat could lessen adverse impacts to recreational fishing in the region (Kneebone and Capizzano 2020). All other impacts are anticipated to be similar to those of the Proposed Action and would range from negligible to moderate adverse impacts to minor beneficial impacts.

3.21.7.3 Conceptual Decommissioning

3.21.7.3.1 Onshore Activities and Facilities

Impacts of Alternative C-2 to recreation and tourism resources during decommissioning activities would be similar to those described under the Proposed Action. Impacts would be short-term and would be expected to range from adverse negligible to moderate.

3.21.7.3.2 Offshore Activities and Facilities

Impacts to offshore activities and facilities during conceptual decommissioning would be similar to those described under the Proposed Action and would be adverse negligible to moderate and short-term. Offshore conceptual decommissioning activities would result in impacts to recreational boating, fishing, wildlife watching, scuba diving, and sightseeing. Traffic, noise, lighting, and visible infrastructures IPFs would affect recreation and tourism associated with Alternative C-2. Impacts would be short-term and would be expected to range from adverse negligible to moderate.

3.21.7.4 Cumulative Impacts of Alternative C-2

The cumulative impacts on recreation and tourism would likely be **negligible** to **moderate** adverse to **minor beneficial**. In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-2 and the cumulative impacts on recreation and tourism would be similar to those described under the Proposed Action.

3.21.7.5 Conclusions

Impacts of Alternative C-2

Alternative C-2 could result in reduced impacts to recreational fishing, as WTGs would be relocated from complex fish habitat. This could improve recreational experiences by helping protect fish species that are targeted by recreational fishing vessels. This area is part of cod spawning habitat, and recreational fishers are permitted to catch up to 10 cod per day in this area (NOAA 2021). However, at this distance offshore, recreational fishing predominantly targets highly migratory species (Kneebone and Capizzano 2020). Therefore, it is not expected that impacts would be significantly different from Alternative C-2 to the Proposed Action on recreation and tourism. As a result, BOEM expects that the impacts from Alternative C-2 to recreation and tourism would be similar, but potentially less, to the Proposed Action. All other impacts are anticipated to be similar to those described under the Proposed Action and would be **moderate** adverse with **minor beneficial** impacts.

Cumulative Impacts of Alternative C-2

In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-1 to the cumulative impacts on recreation and tourism would be marginal. BOEM anticipates that the cumulative impacts of Alternative C-1 would be **moderate** adverse with **minor beneficial** impacts. This impact rating is driven by ongoing and planned activities as well as short-term and permanent disturbance associated with both onshore and offshore construction, O&M and decommissioning of the Alternative.

3.21.8 Alternative C-3 - Reduced Layout from Priority Areas Considering Feasibility due to Glauconite Sands

Under the Fisheries Habitat Impact Minimization Alternative C-3, the construction, O&M, and eventual decommissioning of the 11-MW WTGs and an OCS within the proposed Project Area and associated inter-array and export cables would occur within the range of design parameters outlined in the COP,

subject to applicable mitigation measures. However, Alternative C-3 was developed to address concerns regarding pile refusal due to glauconite sands in the southeastern portion of the Lease Area while still minimizing impacts to benthic and fisheries resources. Alternative C-3a, C-3b, and C-3c described in Section 3.7.8, *Benthic Resources*, consider different WTG configurations to avoid sensitive habitats and engineering constraints while still meeting the NYSERDA OREC. This alternative only considered removal of WTGs from Priority Area 1 based on consultation with NMFS. Areas with high density of boulder, complex habitat, and data suggesting Atlantic cod aggregation and spawning was considered when determining which WTGs to remove.

3.21.8.1 Construction and Installation

3.21.8.1.1 Onshore Activities and Facilities

Impacts of Alternative C-3 to recreation and tourism resources during construction activities would be similar to those described under the Proposed Action. Impacts would be short-term and would be expected to range from negligible to moderate adverse impacts to minor beneficial impacts.

3.21.8.1.2 Offshore Activities and Facilities

Impacts of Alternative C-3 to recreation and tourism resources during construction activities from traffic, noise, lighting, and presence of structures would be similar to those described under the Proposed Action. Impacts would be short-term and would be expected to range from negligible to moderate.

3.21.8.2 Operations and Maintenance

3.21.8.2.1 Onshore Activities and Facilities

Impacts of Alternative C-3 to recreation and tourism resources from O&M activities of onshore facilities would be similar to those described under the Proposed Action. Impacts would be long-term and range from negligible to moderate.

3.21.8.2.2 Offshore Activities and Facilities

O&M activities under Alternative C-3 to offshore facilities would be similar to those described under the Proposed Action. Under Alternative C-3a, up to 87 11-MW WTGs would be installed in the 87 potential positions, 7 WTGs less than considered in the Proposed Action. Under Alternative C-3b, up to 84 WTGs would be installed in the 87 potential positions, 10 WTGs less than considered in the Proposed Action. Under Alternative C-3c, 80 WTGs would be installed in the 87 potential positions, 14 less WTGs that considered in the Proposed Action. Less WTGs installed and in different locations compared to the Proposed Action could result in less impacts to recreational fishing. All other impacts are anticipated to be similar to those of the Proposed Action and would range from negligible to moderate adverse impacts to minor beneficial impacts.

3.21.8.3 Conceptual Decommissioning

3.21.8.3.1 Onshore Activities and Facilities

Impacts of Alternative C-3a, C-3b, C-3c to recreation and tourism resources during decommissioning activities would be similar to those described under the Proposed Action. Impacts would be short-term and would be expected to range from adverse negligible to moderate.

3.21.8.3.2 Offshore Activities and Facilities

Impacts to offshore activities and facilities during conceptual decommissioning would be similar to those described under the Proposed Action and would be adverse negligible to moderate and short-term. Offshore conceptual decommissioning activities would result in impacts to recreational boating, fishing, wildlife watching, scuba diving, and sightseeing. Traffic, noise, lighting, and visible infrastructures IPFs would affect recreation and tourism associated with Alternative C-3a, C-3b, C-3c. Impacts would be short-term and would be expected to range from adverse negligible to moderate.

3.21.8.4 Cumulative Impacts of Alternative C-3

The cumulative impacts on recreation and tourism would likely be negligible to moderate adverse to minor beneficial. In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-3 and the cumulative impacts on recreation and tourism would be similar to those described under the Proposed Action.

3.21.8.5 Conclusions

Impacts of Alternative C-3

Alternative C-3 is not expected to result in impacts that would be significantly different from the Proposed Action on recreation and tourism. As a result, BOEM expects that the impacts from Alternative C-3 to recreation and tourism would be similar to the Proposed Action. All other impacts are anticipated to be similar to those described under the Proposed Action and would be **moderate** adverse with **minor beneficial** impacts.

Cumulative Impacts of Alternative C-3

In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-3 to the cumulative impacts on recreation and tourism would be marginal. BOEM anticipates that the cumulative impacts of Alternative C-3 would be **moderate** adverse with **minor beneficial** impacts. This impact rating is driven by ongoing and planned activities as well as short-term and permanent disturbance associated with both onshore and offshore construction, O&M, and decommissioning of the Alternative.

3.21.9 Comparison of Alternatives

Construction, O&M, and decommissioning of Alternatives B, C-1, C-2, and C-3 would have the same overall negligible to moderate adverse impacts and minor beneficial impacts on recreation and tourism. Table 3.21-3 provides an overall summary of alternative impacts.

Table 3.21-3. Comparison of Impacts on Recreation and Tourism

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
No Action Alternative: BOEM anticipates that the No Action Alternative would have **moderate** adverse impacts and **minor beneficial** impacts to recreation and tourism. Recreation and tourism would continue to be affected by existing environmental trends and ongoing activities in the GAA, including vessel traffic, noise and trenching from periodic maintenance or installation of coastal and nearshore infrastructure, and onshore development activities. *Cumulative Impacts of the No Action Alternative:* In context of reasonably foreseeable environmental trends, the No Action	*Proposed Action:* BOEM anticipates the construction, operation and maintenance, and conceptual decommissioning of the Proposed Action would have **moderate** adverse and **minor beneficial** impacts to recreation and tourism. The overall effect of the Proposed Action on recreation and tourism would be expected to be **moderate** adverse and **minor beneficial** impacts, as recreation and tourism activities are expected to continue with most impacts being avoided with APMs in place. *Cumulative Impacts of the Proposed Action:* BOEM anticipates that the cumulative impacts on recreation and tourism in the GAA would be	*Alternative C-1:* BOEM expects that the impacts from Alternative C-1 to recreation and tourism would be similar, but potentially less, to the Proposed Action. All other impacts are anticipated to be similar to those described under the Proposed Action and would be **moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of Alternative C-1:* In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-1 to the cumulative impacts on recreation and tourism would be marginal. BOEM anticipates that the cumulative impacts of Alternative C-1 would be **moderate**	*Alternative C-2:* BOEM expects that the impacts from Alternative C-2 to recreation and tourism would be similar, but potentially less than the Proposed Action. All other impacts are anticipated to be similar to those described under the Proposed Action and would be **moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of Alternative C-2:* In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-2 to the cumulative impacts on recreation and tourism would be marginal. BOEM anticipates that the cumulative impacts of Alternative C-2 would be **moderate**	*Alternative C-3:* BOEM expects that the impacts from Alternative C-3 to recreation and tourism would be similar to the Proposed Action and would range from **be moderate** adverse with **minor beneficial** impacts. *Cumulative Impacts of Alternative C-3:* In context of reasonably foreseeable environmental trends, the incremental impacts contributed by Alternative C-3 to the cumulative impacts on recreation and tourism would be marginal. BOEM anticipates that the cumulative impacts of Alternative C-3 would be **moderate** adverse with **minor beneficial** impacts. This impact rating is driven by ongoing and planned activities

No Action Alternative (Alternative A)	Proposed Action (Alternative B)	Fisheries Habitat Minimization (Alternative C-1)	Fisheries Habitat Minimization (Alternative C-2)	Fisheries Habitat Minimization Considering Feasibility Due to Glauconite Sands (Alternative C-3)
Alternative's impacts on recreation and tourism would be marginal. The cumulative impacts on recreation and tourism would be **moderate** adverse and **minor beneficial** impacts.	**moderate** adverse impacts and **minor beneficial** impacts. In the context of reasonably foreseeable environmental trends, the incremental impacts contributed by the Proposed Action would be marginal.	adverse with **minor beneficial** impacts. This impact rating is driven by ongoing and planned activities as well as short-term and permanent disturbance associated with both onshore and offshore construction, O&M and decommissioning of the Alternative.	adverse with **minor beneficial** impacts. This impact rating is driven by ongoing and planned activities as well as short-term and permanent disturbance associated with both onshore and offshore construction, O&M and decommissioning of the Alternative.	as well as short-term and permanent disturbance associated with both onshore and offshore construction, O&M, and decommissioning of the Alternative.

3.21.10 Summary of Impacts of the Preferred Alternative

BOEM has identified Alternative C-3b as the Preferred Alternative as depicted in Figure 2.1-10. Alternative C-3b would include installation of up to 84 WTGs, which is 10 fewer WTGs than the maximum WTGs proposed under the PDE of the Proposed Action. Construction and decommissioning activities would result in increases in vehicle traffic, vessel anchoring, vessel traffic, noise, lighting, visible construction activities to recreational users and tourists, and land disturbance in areas used to recreation and tourism and construction areas adjacent or in close proximity to recreation and tourism areas. Project O&M would result in both short-term and long-term IPFs from vessel traffic, vessel anchoring noise, lighting, and visible infrastructure.

3.21.11 Proposed Mitigation Measures

The mitigation measures listed in Table 3.21-4 are recommended for inclusion in the Preferred Alternative.

Table 3.21-4. Additional Proposed Measures: Recreation and Tourism

Measure	Description	Effect
Safety Plan, Communication Plan, and Noise	BOEM and BSEE would 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	These plans would help minimize adverse impacts from

Measure	Description	Effect
Mitigation Measures	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 would consider measures and BMPs included in: US 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; US Department of the Interior Director's Order #41: Wilderness Stewardship, effective May 13, 2013; NPS Reference Manual 41: Wilderness Stewardship, effective 2006; NPS Policies Chapter 6 – Wilderness Preservation and Management, 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.	construction activities and help ensure that to the extent possible, the primitive nature of these areas is maintained.
Federal Survey Mitigation Strategy	The 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 duration (30+ years) of wind energy development in the Northeast U.S. (Mitigation Program). The Mitigation Program would 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 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 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	This Strategy would help minimize adverse impacts to recreational fishing in the vicinity of the SRWF by mitigating impacts of wind energy development on fisheries surveys.

Measure	Description	Effect
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 Outer Continental Shelf Pursuant to 30 CFR 585 or as modified in response to public comment.	A compensation program for gear loss and damage would minimize impacts to recreational fisheries in the waters surrounding the SRWF.
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-trawable" habitat, such as rocky habitat, then the Lessee should consider using materials that mirror the benthic environment.	This measure would help mitigate impacts to recreational fishing.
Mariner Communication and Outreach Plan	Sunrise Wind would 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 would 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; • 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 would 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 would be filed annually during construction and decommissioning, and every 5 years during operations.	A comprehensive Marine Communication and Outreach Plan would minimize impacts to recreational fishing and other recreational users by informing recreational users of construction, O&M and decommissioning activities and informing users of proposed changes that have the potential to impact existing uses, which would help minimize impacts.

3.21.11.1 Effect of Measures Incorporated into the Preferred Alternative

The mitigation measures listed in Table 3.21-4 are recommended for inclusion in the Preferred Alternative. Sunrise Wind would coordinate with the NPS and Fire Island National Seashore to ensure that measures are taken to minimize noise and direct impacts to recreational users and tourists during construction and decommissioning activities This coordination would help minimize impacts to recreation and tourism activities that occur on the NPS land adjacent and in close proximity to proposed construction areas. These measures, if adopted, would have the effect of minimizing the overall impacts to recreation and tourism from the Preferred Alternative to **negligible** to **moderate** with **minor beneficial** impacts.